OCTOBER, 1951

American Engineer

ENGINE[illegible] WINGS

By [illegible]s, P.E.,
E[illegible]r, *NSPE*

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American Engineer

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Letters

Plaudits . . .

Dear Editor:

The July 1951 issue of the AMERICAN ENGINEER has been read and as usual thoroughly enjoyed. Since the prize winning Essay published on page 18 of this issue is from our chapter area, we are particularly anxious to secure six additional copies for distribution to the people concerned and for school, library, and newspaper files.

G. M. BRADY,
Galveston, Texas

What's In a Name . . .

Dear Editor:

The stand taken by Engineer Will D. Sampson (June, 1951) in expressing his views on the subject of the title ENGINEER is well taken and unquestionably will be concurred to by many. However, why should we, as Engineers, attempt to ape another professional title. The title engineer is a proper one for our profession, but it should be protected and reserved for those rightfully entitled to use it.

The problem is not only what we may call ourselves but also what is performed under that title. This question should be established and maintained. Therein lies the solution to the subject. Various states have laws but few enforce the laws. Without teeth to these laws we will have a continuance of the tactics now foisted on the public, who, in large part, have little or no understanding of the facts and seldom know how or what they are encountering or the advantages to be gained by dealing with the truly responsible and recognized engineer of proven ability.

In many sections of the country we have these so-called engineers who have no regard for principles or standards and in many instances, no ability or experience. They rely on the others they employ for a nominal sum to carry on the activity without consideration for the welfare and safety of the public.

No, we do not need a new title but let's insist on the adoption of proper laws and complete enforcement of these laws, as they have been enforced by the medical profession and the legal profession. Educate the public as to the advantages to be derived from the services of the experienced engineer, and let us add to the prestige of the title.

However, in so doing let is be known that among us we have the professional engineer who misuses the confidence placed in him by placing his seal on anything for a pittance. What price a Code of Ethics?

FRANK M. BATES,
Bristol, Pa.

Pork . . .

Dear Editor:

How many times have we, as citizens, criticized politicians for their free-spending policies; and how many times have we, as engineers, refused to contribute to the politicians' delinquency by declining the opportunity to design their projects? How many engineers who are corporation and industry executives have deplored Government spending but have been right in there pitching when contracts were being let for pork barrel projects? We all know the answers to these questions. Hypocrisy is not becoming to those who would be considered professional.

Our stupidity is leading us into monstrosities like the Central Arizona Project. Here is a pork barrel that would suit Paul Bunyan. Just think of it, $700 million to provide irrigation at $1,800 per acre for land worth $300 per acre to produce more crop surpluses to be subsidized. While the Department of the Interior is fathering this project the Department of Agriculture is trying to reduce the number of acres under cultivation. But the juiciest part of the pork is what it amounts to for a few citizens at the expense of many others. The beneficiaries of this nonsensical pap will pay absolutely no capital costs and only thirty-seven one-hundredths of one per cent of the interest. The cost of the interest alone to the nation during the seventy year "amortization" period is estimated to be in excess of two billion dollars. Incidentally, competent authorities have estimated that the dam will be completely silted and useless in forty years. The $700 million investment and $2 billion interest, by past performance, are gross underestimates, too.

Has anyone else come to the simple conclusion that without engineers to do the work the politicians could only dream about their magnificent vote-getting projects? Engineers' civic responsibilities, ha!

GEORGE E. REMP, P.E.
Gainesville, Fla.

Utopia . . .

Dear Editor:

With regard to the present public relations program of the National Society of Professional Engineers, I offer the following comments as of directive substance along with the program:

On large engineering construction jobs crane operators are handed $25,000 tools well maintained and are paid close to $7,000 per year in salary w. extras. In addition they are given assistance in their work and are well esteemed. (True, the professional engineer is in charge of all this, however comparatively little is expended on his personal equipment.) How many professional engineers are personally well equipped? Few today, perhaps more tomorrow? Professional Engineers should have even more tools and as easily as the crane operator is accorded his.

How is the engineer to obtain his tools for proper work? He can be given better working conditions and equipment and assistance on the job but for one there should be the recognition of money as an engineers tool. He must be given his rightful capital in addition to his living wage otherwise civilization suffers. High capital advance reserves on the part of the engineer are necessary. He must maintain a loyal family which for an engineer should be kept in the best of home comfort so that every possible aid can be given him in the furtherance of his works for the good of mankind. His home should be his own on a goodly piece of land. It should be well furnished and ought to include a 2 to 4 car garage with two cars always well maintained as a minimum. His home must have guest rooms and a study complete with swivel chair, flat top desk, filing cabinet, typewriter desk, typewriter and portable typewriter, etc., wire recorder, calculator, possibly a studio and drawing table or desk and a large separate library well stacked

(*Continued on page 6*)

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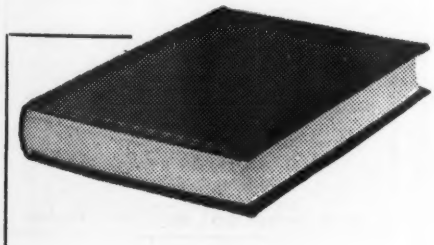

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Letters

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He should have the best in periodicals, radio, TV, cameras both motion, still and even possibly an aerial camera, microfilm file, etc. He should be able to afford a summer home and the best hotels, air transportation and even possibly a private airplane of his own. He should have servants when he needs them. He should be able to indulge in expensive hobbies and maintain membership in many professional and non-professional groups entailing a sizable yearly expense.

An engineer as a creator is naturally expected to have more real and private property than the average and he further should be capable of aiding others. The right of an engineer as a private citizen to own private property must thus be professionally related to his proper status.

Full recognition must prevail of the rights of the professional engineer to hold all the private property he possibly well can. All reason tells us this is apt to be large and extensive and professionally related to the good welfare of the country and world as a whole.

The domain of the engineer is professionally related to the most valued property of all . . . mental property. His work with education, libraries, studies, research, development, improvement, design, production and maintenance, patents, corporation organization, management, law, etc. . . . all lead to high living standards for the engineer as a necessity for all.

It is not too much to ask that every registered engineer of the society should have these tools at the outset of his professional career. Further some amends must be due those already well along in their professional careers.

CHARLES W. DOHN, P.E.,
Glendale, L. I., N. Y.

Free Boost . . .

Dear Editor:

I like the AMERICAN ENGINEER magazine very much. It is well prepared and arranged and easy to read. And the information is excellent. I like to read the technical articles, and then criticize in my own mind. Publish more of them.

This boost is free—no charge.

J. B. DELANCEY,
Box 236
N. East, Md.

Starting Salaries . . .

Dear Editor:

Harry M. Gloss, Jr., who in your July issue writes about the reported $8,000 starting salary for engineering graduates, states he is not yet a P.E. I am relieved to know this for he shows a distressing inability to separate truth from sensationalism and to reason correctly even if he did recognize the facts.

Doubtless there have been some $8,000 starting salaries, but they are like snow in August which Mr. Gloss should know, you have to climb Mt. Washington to find—occasionally—in New England.

There recently came to me a voluminous "wanted" list sent to our Society by the Ford Motor Company describing engineering positions they desired to fill. The top salary offered was $628 per month for supervising engineers of many years' important experience.

At one of our Society meetings last Winter, we took an impromptu poll of salaries. The average of salaries was $8,027, with some even below $5,000. And this was a group of Professional Engineers, many holding important and responsible positions.

The first Vice President of our New York County Chapter, Prof. Herbert F. Roemmele of Cooper Union is constantly being approached by employers who want to hire engineering graduates at $50 per week. He has to tell them that the going rate is around $75.

When Mr. Gloss writes of $8,000 he must be thinking of bricklayers or electricians!

All anyone has to do is to look at the employment agency columns of the *New York Times* to find out what is offered for 10-15 year experienced engineering services. Such offerings range from $5,500 to $12,000 with most in the $6,000 to $8,000 group.

There is only one major reason why young men are not flocking to engineering schools. It is because the rewards—I mean money—are not compensatory for the time and effort spent. How many engineers, paid $5,000 in 1940 are now getting $12,000? And yet unless they are, they have had to reduce their standard of living due to high taxes and high living costs.

The reason large employers of engineers are not offering more is because they have so many low salaried engineering employees whose pay they would have to bring up that they fear serious impairment of their profit position.

One evidence of this is the tremendous growth of engineering contracting organizations. A company whose men are getting $8,000 and hence can not hire new ones at $10,000 can engage a contractor who pays his men $12,000. The reason the first group doesn't leave is because for many of them high taxes plus loss of pension rights would offset the difference. But that is not a consideration for a young man looking for a career.

Because of these facts it will take time to raise the general level of engineering salaries. But the powerful law of short supply and high demand is finally working in favor of our underpaid profession.

I personally know any number of men who started in engineering but left it for financial reasons. Some doubtless could be called back, but it will take adequate rewards to do it.

There is one way in which the situation can be remedied quickly. In any number of instances engineers are used very inefficiently. They are not given proper assistance and thus spend only 25% of their time doing engineering thinking, the other 75% going to answering telephones, taking messages, writing out mail longhand to be copied by a typist, working up reports in pencil, making finished drawings instead of just sketches. There are many cases where four engineers can be replaced by two engineers plus two assistants. But the two who remain must have their pay raised.

Let us have less complaints about the shortage of engineers and a more intelligent approach to correcting the causes of this shortage.

H. GREGORY SHEA
New York, N. Y.

Telling Youth . . .

Dear Editor:

Mr. Mason's contribution to the August issue, "A Program for Progress," forces one who has spent time in industry and engineering education to pause and ask some questions. As it is a "think" article, it has done its job in this case at least. This engineer has done some thinking, but as an engineer.

Mr. Mason raises some questions that perhaps need not be raised as they becloud the issue. He does this by not acting like an engineer. I refer in particular to the fact that he is not specific, as an engineer should be. He states, "One group seems to favor more cultural studies." To be specific —who is this group and what is their interest in engineering? Then to be even more specific and even more to the point, what are "cultural studies"?

The phrase "humanistic and cultural studies" has been too long bandied about without specific definition and has long been the bane of those professionally trained engineers whose responsibility it is and has been to define the program of engineering education. It is the growing opinion of many that that hackneyed phrase should be scrutinized most carefully in terms of the true aims and motives if we are to retain our American heritage.

Mr. Mason, in the beginning of his discussion, makes a fine start when he points

(*Continued on page* 33)

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"Therefore when we build, let us think that we build forever. Let it not be for present delight, nor for present use alone. Let it be such work as our descendants will thank us for, and let us think, as we lay stone upon stone, that a time is to come when those stones will be held sacred because our hands have touched them, and that men will say, as they look upon the labor and wrought substance of them, 'See, this our fathers did for us'."

—John Ruskin.

Engineers With Wings 8
By Paul H. Robbins, P.E., Executive Director, N.S.P.E. The air force has set up a program to use its young engineer-officers intelligently and efficiently.

You Can Direct Your Profession's Future 12
By Dr. John A. Perkins, President, University of Delaware. Such groups as the doctors, lawyers, and farmers work closely with universities as advisors—why not engineers?

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NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS FOUNDED 1934

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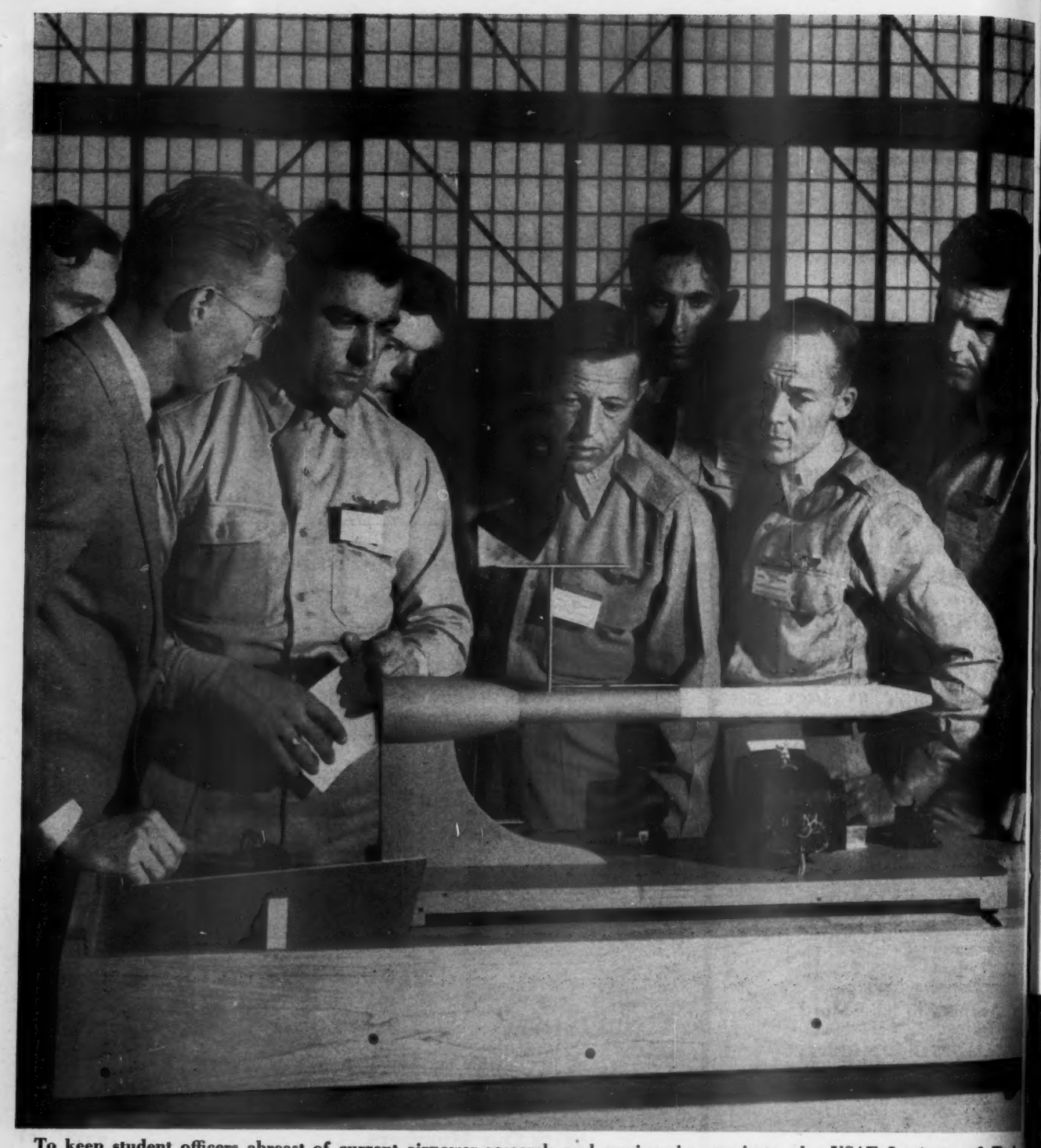
Advertising Representative:
Warren T. Mayers Company,
55 West 55th Street,
New York, New York

The American Engineer is published monthly by the National Society of Professional Engineers, 1121 15th St., N. W., Washington 5, D. C. Entered as Second Class Matter Feb. 8, 1948, at the Post Office, Baltimore, Md., under act of March 3, 1879. Copyright, 1951, by the National Society of Professional Engineers. Not responsible for opinions expressed in signed articles. Subscription Rates: $2 per year in advance to members of NSPE and its Affiliated Societies; $3 per year in advance to non-members in U. S. A. and its possessions, Canada, and Mexico. Foreign, $4 per year. Single copy, 35c.



To keep student officers abreast of current airpower research and engineering projects, the USAF Institute of Technology summer curriculum includes a two-week tour of installations throughout the country. The above group studies a model missile at NACA's Moffett Field facility, California.

ENGINEERS WITH WINGS

By Paul H. Robbins,
Executive Director, NSPE

The Air Force Has Set Up a Program to Use Its Young Engineer-Officers Intelligently and Efficiently

According to a recent survey of NSPE members, about thirty-five percent of those who served in World War II felt their abilities as professional engineers were not utilized as fully as they might have been. Because this unfortunate situation was a serious problem in the recent war, many government and commercial organizations have given it considerable thought and attention since the development of the present defense program and the current critical engineering manpower shortage.

The NSPE, of course, has shared this concern and in so doing has worked with those in the Pentagon in endeavoring to place a greater emphasis on the effective use of professional engineers called into service. These discussions recently led to an invitation to Society officials by Air Force Secretary Thomas K. Finletter to visit Wright Field in Ohio to see for themselves what the Air Force is doing to make good use of its engineers. As one making this revealing trip, it is gratifying to report that the Air Force is taking steps to utilize in an effective manner its young engineers called to active duty from ROTC units and other sources. The Air Research and Development Command at Wright Field is the center of the program.

Two USAFIT students gain a better understanding of radio circuits through making calculations on an intermediate frequency amplifier such as is used on modern Air Force planes.

This Command has established an indoctrination course aimed at orienting young engineering officers called to active duty to engineering opportunities and problems confronting the "birdmen." A prominent part of the school is an assignment and interviewing panel which tries to make certain that the potentialities of each young engineer are utilized to the utmost by the service.

(Editor's note: The Air Research and Development Command handles the bulk of the Air Force's scientific research. Its engineering applications, in all fields of technical competence, are myriad.)

Young graduates from almost every engineering school in the United States have been assigned to the school. (87 colleges were represented in the class of 300). Almost 100% of them are products of the Air Force ROTC program. A few were given direct commissions by the Air Force. These young men, ordered to active duty in uniform as second lieutenants, are given a course five weeks long. Half of this time is devoted to technical engineering material and the other half to teaching leadership and organization.

Left: In the USAFIT Electrical Machinery Course, students interest themselves in an aircraft generator used to provide DC power for aircraft in flight. Frequent fluctuations in load conditions necessitate a constant check on voltage regulation.
Right: This would look like hangar-flying at first glance, but an explanation of aerodynamics is underway as the instructor illustrates a point to students in USAFIT's aeronautical engineering course.

The school emphasizes the all-around approach to the Air Force's engineering problems. Young engineer-officers are not separated by specialty—all attend the same classes. High ranking engineering officers and civilian engineers employed by the Air Force lecture on the problems of their work to the entire group. The inter-relationship of all kinds of engineering to produce a workable end product is highlighted.

For example, an aeronautical engineer might discuss the design of the new Bell X-5, the latest word in jet airplanes, a complicated "job" with variable swept-back wings. He would be followed by a structural engineer and a mechanical engineer who would discuss the practical problems involved in building the plane. An electrical engineer would tell the young officers all about the instruments which move the swept-back wing. A chemical engineer talks about problems caused by corrosion of metals on the plane and in its enormously complicated instruments and mechanisms. A ceramics engineer might wind up the session with comments on problems involved in containing the enormous heats developed by the jet engines.

ALL in all, it's a pretty well rounded session and the young engineers are introduced to problems far beyond their specialty.

As NSPE observers, we were interested to note the emphasis the Air Forces places on leadership in training its young engineer-officers. Personality development is a side of a young engineer's professional equipment too often neglected by engineering school and industry.

One half of all the time spent in the school is devoted to leadership and organization. Three lecture hours daily are given to various phases of the subject: Personnel Management, Communication Skills, Human Relations and like material.

Engineers turned air force officers get first hand knowledge on aircraft construction.

"We try to teach these young men that they must lead, rather than command," Major Sam Hamilton, Commanding Officer of the school, told us.

The subject matter of the Human Relations Section of the course includes a "scientific and psychological analysis of human abilities and emotions leading to a more effective career." Other problems treated are the elements of publicity, relations with the public, speaking and writing for publications, relations with foreigners, techniques of interviewing, motives and incentives, attitudes, frustrations, relations with Civil Service personnel, and logical methods of approaching personal problems.

The technical instruction given the young officer-engineers will be of interest to NSPE readers. Two hours a day are devoted to lectures on selected engineering principles and aeronautical developments of concern to Air Force Research and Development Engineers. The third hour of the technical instruction day is devoted to specific problems of the project engineer. Management of a project from inception to follow-up service is explained. Discussions are held on all types of administrative problems and services that can be involved.

The final hour of the classroom day presents organizational material to the new second lieutenants. The course begins with international relations and examines organizational structures of various bodies down to the organization of laboratories within the ARD command.

One limitation upon the school, imposed by lack of space and funds, is that all instruction is by lecture. The tedium of the lecturer's presentation is relieved somewhat, however, by field trips. Right at the school's doorstep lie some of the world's best equipped laboratories. In addition, tours through the Air Force hangars afford first hand experience with all types of aircraft, including the incredible B-36 bomber.

It is in the matter of making assignments to permanent duty that the program holds the most promise. It is a far cry from making cooks of engineers and assigning cooks to engineering duty, a fault for which the services, justly or unjustly, have often been blamed. The Air Force seeks to assign these men to engineering jobs suitable to their capabilities and tastes, consistent with its needs.

DURING the indoctrination period, engineers from each of the research programs of the Air Research and Development Command, from stations all over the nation, come to the engineering school and explain their personnel needs to the class.

This familiarizes each student-officer with the major engineering needs of ARD and enables him to judge intelligently what activity he is interested in and would like to participate in.

At the end of the training period, each student-officer confers with an "interview panel" made up of several senior officers, at least one of which is an engineer in the field of his specialty. The interviewers talk informally with the young engineer for about half an hour, during which the senior officers form an opinion (usually pretty accurate) of his competence, interest and personality.

Assignments are made upon the basis of the needs of the service, the young officer's request, and the interview panel's judgment of his ability to perform the kind of work requested. Since an experienced engineer is on the panel, an informed calculation can be made of his professional capabilities and limitations.

In the Air Force, as in many another field, the need for engineers mushroomed with the coming of Korea. "We could have used a good share of the engineering graduating class of 1951," Major Hamilton told us, "and we wouldn't be wasting them, either. There are that many

important research and development projects going on that require engineers to bring them to a successful conclusion."

Where do Air Force engineers come from? "We couldn't begin to find enough of them from our reserve officer personnel," Major Hamilton said. "We had to call them up from the ROTC."

"Inasmuch as we can, consistent with the needs of the service, we try to get our engineering research officers from the cream of the ROTC crop," we were told. "A selection team from the headquarters of the Air Research and Development command examined the transcripts of about 3,000 engineering ROTC students before selecting the 536 that we took."

Engineering college authorities cooperated in recommending students for the school. Not only were students picked upon the basis of their grades, but also for personality factors which indicated that they would make good officers.

The range of assignments possible for these young engineers is fabulous. Let's assume for a moment that you are Second Lieutenant Bill Jones, a June, 1951 graduate of MIT. You were a member of the Air Force ROTC and received orders to report for active duty following graduation. You're an electrical engineer. What are some of the things you might be doing?

There are thousands of jobs you might be called on to fill. For example, you might work on instrumentation problems. Intricate instruments play a key part on all kinds of Air Force equipment—fire control, electronic computing, parachute drops, and literally thousands of other problems. The electronics equipment on many modern jet planes and on our supercolossal bombers now costs more than the engine power plants.

As Second Lieutenant Jones you are a bit astounded when your instructor tells you that the day of the pilot in the Air Force may be about over and the day of the engineer at hand. Pilotless aircraft has progressed so far that the flying stickmen may be obsolete before too long. Second Lieutenant Bill Jones, electrical engineer, will find plenty of challenging research projects in the Air Force.

If Bill had been a mechanical engineer, he would also find novel problems with the "birdmen." Designing and experimenting with power plants of jet engines, working in equipment labs, wind tunnels and air conditioning are only a few examples. Theoretically, jet planes must be able to perform equally well at the North Pole or the Sahara Desert—at 50,000 feet. "Bugs" in the aircraft like the icing of air scoops which caused six of nine jet planes to crash in Indiana recently, must be ferreted out and repetitions of the disaster avoided. As a mechanical engineer, it might be your job to find them.

The screening process for final assignments starts during the second week of class, following one week of basic Air Force indoctrination. This process has proved immensely profitable both to the service and to the officer involved. There was, for example, the case of the engineer who had done considerable research in television. (He was somewhat older than the usual run of student.) He was assigned duty working on a visual bomb sight, employing television principles.

By employing officers in work in which they are interested, the Air Force gets a "bonus" of special interest and competence from every officer run through the selection process. This "bonus" might easily have been dissipated had assignments been made at random.

Originator of the idea for the school was Colonel Perry M. Hoisington, Director of Personnel of ARDC. Brigadier General Leighton Davis, Commanding Officer of the U. S. Air Force Institute of Technology under which the school is operating, has given it enthusiastic support.

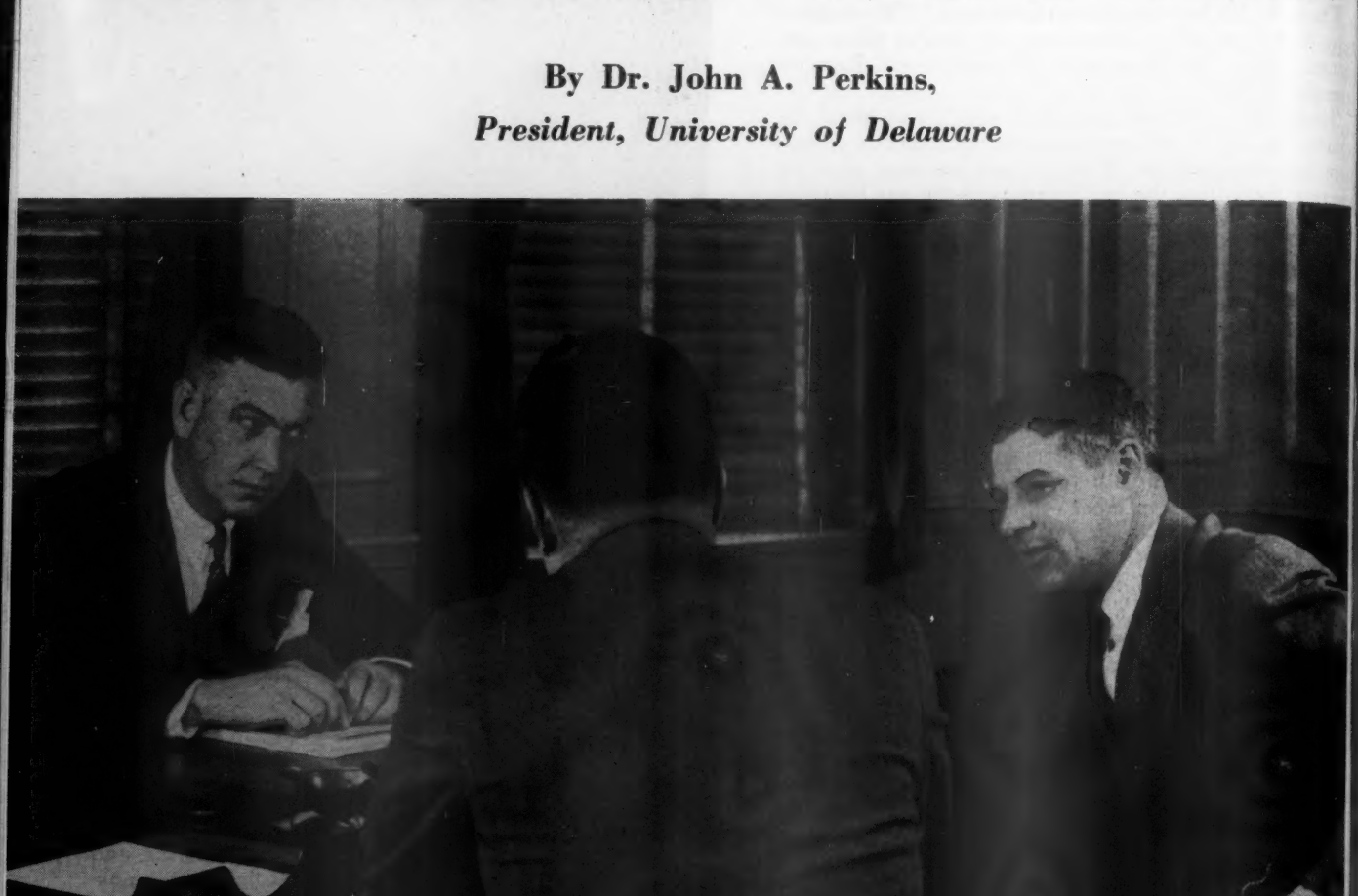
The school appears to be an intelligent beginning to an immense problem, that of utilizing engineers in the armed forces properly during a period of intense shortage. The program should be extended to the entire Air Force, and other branches of the armed forces might find it profitable to examine the indoctrination school at ARDC and see if the general principles there involved might not be of help in solving their own engineering personnel problems.

Major Sam Hamilton heads Institute's ARDC Indoctrination School.

USAF Institute of Technology is today the 31-year development of technical education for AF officers. Its predecessors included the old Air Corps Engineering School, which graduated many notable AF leaders, including Generals Wolfe, Craigie, Chidlaw, Fairchild, Kenney, Echols and others. Shown here is the class of 1922-23; officer in back row, right, is Lt. James Doolittle.

You Can Direct Your Profession's Future

By Dr. John A. Perkins,
President, University of Delaware



Such groups as the doctors, lawyers, and farmers work with their colleges; why not engineers?

ACCORDING to Funk and Wagnalls, a profession is an occupation that properly involves a liberal education or its equivalent and mental rather than manual labor. Any group which fits this definition is, of course, of interest to me. My profession is to provide educaton of the variety required by your profession. It may at once be concluded we have much in common. Our mutual interest is something of a mutual problem at this time. In fact, the very future safety of the country may depend upon its wise solution.

The importance of education to our country has been recognized from the outset. This early concern for education was owing to its importance to a self-governing nation. For example, Jefferson stated:

"If a nation expects to be ignorant and free in a state of civilization, it expects what never was and never will be. . . . There is no safe deposit (for the functions of government), but with the people themselves; nor can they be safe with them without information."

Somewhat earlier Washington had propounded a similar idea when he advised Congress:

"Promote then, as an object of primary importance, institutions for the general diffusion of knowledge. In proportion as the structure of a government gives force to public opinion, it is essential that public opinion should be enlightened."

These suggestions have been taken up until it has been authoritatively said that America's passion is education. Our emphasis has been engendered out of the realization that intelligent citizenship is important for the very existence of our country. Citizenship education must continue, but the safety of our Nation requires that education of another variety be also emphasized. Beset as we are with critical shortages, the thing most in short supply is trained

manpower, particularly in the profession of engineering.

Important as it is that all people should have an understanding of public affairs, and be educated for citizenship, that is not enough to save us. We must look to our external defenses. That means technical manpower, science and the men who can apply it—the engineers.

What are the causes and cures for this shortage of much-needed engineers? *Causes:* 1) Our backlog of need is especially great owing to the failure to train men during the Second World War. Every other major country kept students going through college during World War II. Our record in this regard may now be considered to be so unsatisfactory as to recommend against its repetition at this time of military recruitment.

2) Almost two years ago, there was propaganda abroad that the engineering field was over-supplied. Since then, young men, poorly informed, have not enrolled in engineering. This means that the present freshman class in our engineering schools is back to a pre-war level.

It is alarming that people would believe that a field of human endeavor so useful as engineering could be overcrowded. Evidently the idea is still about that the way to overcome a depression, if there be one, is to cut production. To cut down on engineers is to embrace the same philosophy that promoted the slaughter of the little pigs. If an engineer is the producer he purports to be, he is desperately needed when things go sour economically. The other point for reflection in this propaganda is that engineering education is not generally useful to a man. If there is no technical job, is an engineering education of no good to the student? I do not think this *is* or *should be* the situation. In making engineers, we are not making so many specialized fittings. We should be making an interchangeable human part, men of general use to themselves and to society. *If a little propaganda that there are not enough specialized jobs can so decimate the enrollment of our engineering schools, it behooves the professional engineers to explain to the general public what the inherent values of an engineering education are.*

If engineering education does no more than narrowly prepare a man for the first rung of a vocation, very possibly it should be enriched. The situation created by this propaganda is to be lamented, but it should also provoke the engineers to make an analysis of engineering education. Let us consider the present situation an opportunity to re-examine engineering education.

THIS is not a job for the professors alone. It calls for the cooperation of practitioners whose insights are developed out of a rich professional experience. You men who are working in the field should have much to suggest to the professors of engineering that would enrich their teaching, both in content and in method. To this end, possibly we should create at the University of Delaware and other schools, "visiting committees" corresponding to our several departments in the engineering school. The best engineering talent in our area and elsewhere should be enlisted for these committees. I am confident that through cooperation with the professional engineers and our capable and conscientious staff, our engineering program can be strengthened. That such cooperation can benefit a particular professional school has been demonstrated again and again by the farmers in my state of Delaware and elsewhere.

Agricultural education, research and extension have been steadily strengthened owing to the interest of the men on the farms. These men know that what goes on in the universities is important to their own individual well-being. As professional engineers you cannot simply take for granted that other elements in the population will look out for your special interest and responsibility in the field of education—engineering education.

Perhaps the "all purpose" character of engineering education can be strengthened without weakening the vocational or professional character of engineering education. We must keep in mind the dictionary definition of a profession. A profession, you will recall, "properly involves a liberal education." Perhaps the professional engineer can be given a good bit of liberal, cultural or general education (call it what you will) along with his technical work and to do both is simply to give assurance that engineering is, indeed, a profession. I suspect more engineers fail on the job or don't reach the pinnacle of their profession for lack of such an educational background than ever fall short because of lack of technical competence!

Mortality in the engineering colleges is about 50 per cent, so an annual input of 60,000 freshmen would be required—double the number that entered the engineering

Production, left, (and this requires engineers) can help us to keep out of depressions. Right. This professional engineer should carry some of his valuable experience back to a college.

Thrilled at the sight of a 15 cu. yd. dragline bucket, these children already are interested in the engineer and his work. Will enough young people go on to join the profession?

schools this year. Thus the further question comes up—how can twice as many high school graduates be attracted to engineering schools?

To do so will be to solve one of the toughest problems that ever confronted the engineering profession.

An increase in the output of the high schools cannot be relied upon, since for the next eight years there will be 10 per cent fewer high school graduates. This reflects the lower birth rate of the Thirties!

On the basis of an average high school output of 1,200,000 boys and girls 5 per cent would be required to produce 60,000 engineering freshmen, or 10 per cent of the boys.

Leaving the question of aptitude, ability and interest for the moment, I should like to call attention to the competition engineering confronts in attracting students.

THERE are a growing number of efforts to persuade bright students to enter particular fields of employment. Examples are the fellowships of the Atomic Energy Commission, the scholarship and fellowship provisions of the National Science Foundation. These programs emphasize basic science. The fellowships and special inducements offered by the Veterans' Administration and by the Public Health Service invite students into careers in the mental health field. The Holloway Plan, assuring young men of a free education, was enacted by Congress in order to secure a larger number of college-trained Navy officers.

If Congress approves the prospective extension of the Holloway Plan to the Army and the Air Force, the competition for the ablest high school graduates will be further increased. Engineering particularly is now apt to lose men to the pure sciences. Science has been glamorized by developments in chemistry and nuclear physics in the last twenty-five years, and is attracting men who a generation or more ago might have turned to engineering. Scholarships sponsored by both business and government are making education easier for the brightest youngsters in science. The social science occupations are becoming better defined each year. The Ford Foundation with its millions will speed the process. Clinical psychology, personnel work, social work, economics, social statistics and public administration will attract a larger proportion of talent in the years ahead.

My conclusion would be that engineering is going to have to hustle to hold the share of students it has heretofore enjoyed.

What might the engineering profession do to assure the needed supply? Remember it is vital to the safety and prosperity of our people that we have more and even better-trained engineers in the years ahead!

The situation, it seems to me, behooves the professional engineer to become interested in education! Herein lies at least part of the answer to this "engineering" problem.

THAT American education is approaching the ideal of universal educational opportunity is most encouraging. School attendance has grown steadily. Each year shows slight improvement in the educational attainment of the adult population. The median school year completed by the population 25 years of age and over, according to 1947 estimates, was the 9th grade. The corresponding figure for 1940 was 8.4 grades. Steady progress has been made since 1900 in diminishing racial differentials in education. There is still a long road ahead. Slightly less than 1 out of 3 persons in the adult population 25 years of age and older who had not completed high school dropped by 10 per cent. Nevertheless before many more people can be induced to study the professions, including engineering, we must graduate more people from high school.

The number of students who leave high school before completing their courses is still far too great.

Of the boys and girls who do finish high school, only one-half of them who could benefit by higher education go on to college.

Why don't they go?

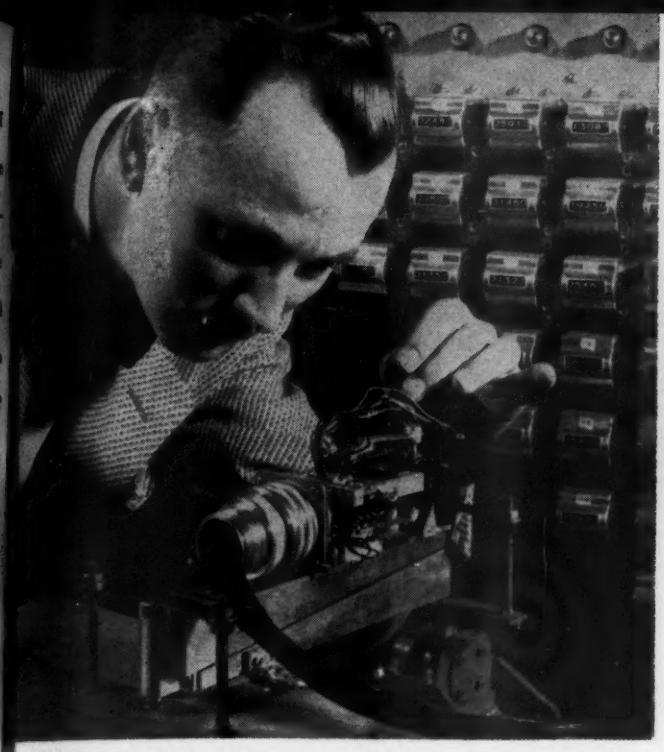
1) *Lack of funds.* We have steadily shifted the increased costs of higher education to the student. In 1939 at Delaware, the student contributed 19 per cent of the cost of his instruction; today he pays 33 per cent. Delaware is no worse in this respect than many other universities. Unlike many other universities, we have almost no scholarship funds except in teacher education. We need scholarships at the University of Delaware so that a college education doesn't depend upon the size of dad's pocketbook but upon Junior's mental ability.

The companies so interested in hiring engineers should see to it that a full crop of talented youngsters is harvested in our colleges. These youngsters are our greatest natural resource. To fail to educate them because they haven't the personal finances to go to college is a waste we can ill afford. Engineering talent is being lost because higher education is too expensive and too many would-be students personally lack the funds to go to college.

2) *Lack of inspiration.* This lack may be in the home. It may be a lack of community enthusiasm for college. It may be in the schools. Teachers who are underpaid are not apt to encourage others to strive for further education.

POOR teachers may neglect talented youngsters or fail to arouse their enthusiasm and develop their aptitudes. A poor elementary school with an uninspired curriculum may account for the lack of mathematical ability so important to the making of engineers. Improved programs in teacher education and the attracting of more talent to the teaching profession may be another step to be taken in making more engineers. This suggestion is not to be

(*Continued on page* 28)



Top: Mechanical Engineer Norman Jasper calibrates strain cycle gage and counter. Below: Modelmaker removes surplus wood from profiled model of PT boat.

Top: The "Sad Sack," especially designed electrical computer, determines vibration characteristics of ships.

Below: Main workshop showing hulls under construction.

Model Ships Are Big Business Here

Professional Engineers Work With Miniature Ships at the Navy's David Taylor Model Basin. Multi-million Dollar Decisions Are Made on the Basis of Tests With Them.

ENGINEERS are saving the Nation thousands of dollars at the Washington, D. C., David Taylor Model Basin—a multi-million dollar engineering project devoted largely to the business of building and testing model ships.

At the time a ship is hardly more than a gleam in some engineer's eye, models of it, made of wood or wax, accurately scaled to the minutest degree, are run through enormously detailed tests at the Model Basin. Engineering data compiled determines whether the designer gets only an "E" for effort, and his drawings go back on the shelf, or whether the ship is worthy of construction.

Operated by the Navy's Bureau of Ships, the Basin saves taxpayers quite a sum. Ships are expensive at best and it's far better to eliminate the "bugs" from them in the model stage than to experiment with the real thing.

All is engineering precision at the Basin. Four towing basins, the largest 3/5 of a mile long, with a total capacity of almost 25 million gallons of mirror-smooth water, provide courses for model ships far beyond anything any hobbyist ever dreamed of. Even a tide 2/1000th of an inch high is taken into account in making the tests.

Models ranging up to 32 feet in length, five feet wide, and weighing five tons can be tested in the largest towing basin.

It is amazing how much can be predicted about ships before they are ever built on the basis of the models. For

Top: Engineer watches path of test propeller in water.

Top: Aluminum sphere submerged in basin to determine rate of sinking. Below: Engineers adjust velocity meter to measure turbulence in stream.

Top: Destroyer hulls shown fastened to carriage. Water moves past them. Below: Miniature explosion blasts models in test pond.

example, the Navy was worried that aircraft carriers of the *Essex* class might not be able to maneuver through the Panama Canal. It was a tight fit, and waters in confined passages like a canal often behave in strange fashion.

Tests conducted at the Model Basin indicated that the *Essex* could be squeezed through the canal. The carriers were built and they go through without difficulty—thanks to engineering planning.

Preparation for the Navy's atomic bomb test at Bikini brought another dramatic example of the testing precision of the Model Basin. The seagoing scientists wanted an estimate of the damage that would be done to test ships. Basin engineers built an entire fleet of miniature ships (to scale in size, weight and other characteristics) which represented the target fleet.

The models were sent to "sea" (a test pond) and a charge of TNT, molded to explode and throw up a wall of water exactly like that produced by the atomic bomb, was detonated. The charge was calculated to be almost exactly one ten-millionth as powerful as the A-bomb. Results came to within six per cent of the actual damage later done to the Bikini target ships by the A-bomb.

THE Model Basin was named for the late Rear Admiral David W. Taylor, who established the U. S. Experimental Model Basin in the Washington Navy Yard in 1899. Admiral Taylor was graduated as a cadet engineer from the Naval Academy in 1885 with the highest scholastic record ever attained up to that time. He later took a number of post-graduate courses in marine engineering and naval architecture in England. He supervised the first model basin for 15 years and firmly established the practicality of testing with models.

The main model basin looks like a canal with a roof. It houses some of the strangest-looking scientific and engineering equipment ever seen. Several carriages straddle the Basin and roll upon exactly aligned track on either side. The carriage is actually a smooth-running electric locomotive designed to carry scientific testing equipment. It can achieve speeds of up to 60 knots or about 75 miles per hour.

A scaled-down model of a ship's hull that follows exactly every twist and curve of the real hull is attached to the carriage. Motion picture cameras, gauges and other eagle-eyed equipment on the carriage records the progress of the ship as it travels down the basin.

Tests can predict all these things: speed, turning circle, rate of turn, critical angle before capsizing, amount of yaw in a heavy sea, effect of high winds, effect of high waves, and even how well the ship will launch.

Construction of the models is fascinating. They are made of wood or wax. Wax is cheaper and less trouble to build (it can be melted and poured into a mold) but it breaks readily and most models are made of wood. The wooden models are made from two-inch-thick pine boards, stuck together by waterproof casein glue. A million pound press supplies the pressure to see that the boards stay in place. Workmen finish and sand the models to a hundredth of an inch of actual scale ratios after a "profiling machine" has trimmed the rough planks to approximate size.

The center of the finished model is hollowed out to accommodate an electric motor, propeller shafts and other instruments for the "power test." In this test, the model literally propels itself through the water "under its own steam." Its tiny propellers are machined to close tolerances and shapes. Power tests are often run with propellers having different numbers of blades, three, four, or five. From these, engineers are able to calculate almost exactly how much horsepower will be needed to push the actual ship through the water at flank (top) speed.

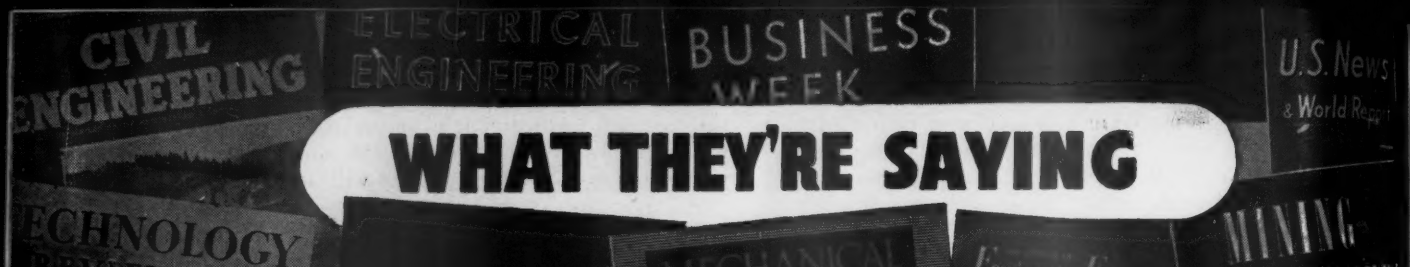
Power tests enable the engineers to determine what propeller arrangement will propel the ship with the greatest efficiency and least harmful vibration.

OTHER ingenious tests are given the models. They are pounded by man-made waves to determine their seaworthiness. The model is held stationary while water flows past it at speeds of up to ten knots in the circulating water test. Cameras record every movement.

Results of the tests are sent to the Bureau of Ships. If necessary, the original design of the ship is altered to correct mistakes. The testing process does not stop here, however. It is important to know whether predictions made on the basis of the tests are borne out by actual performance of the full scale ship.

When the ship is put into operation, engineers check the predictions. Tactical characteristics, speed, propulsion efficiency, effect of wind and current, or rough and shallow water are noted, vibration and other factors are measured. In this way, engineers can confirm test results or make minor corrections for better results the next time.

Below: Interior view of main towing basin showing huge carriages which move hulls and carry scientific apparatus.



FORTUNE LOOKS AT NATIONAL FOLLY

The shortage of engineers, far from easing, is growing worse. The present running deficit is well over 60,000 engineers, against a total of 350,000 to 450,000 employed in all categories. The figure does not include military needs for engineers. It is the more remarkable for the fact that the previous year had seen an all-time high graduating class of 52,000 engineers, peak of the postwar G. I. influx. But these were swiftly absorbed, and the demand continued to mount while 1952 graduation rolls slipped about 14,000 below 1950.

Part of the serious decline in engineering classes is caused by the low birth rate of the thirties, when the great depression not only failed to produce goods, but more tragically failed to raise children. But deeper than this lies a tissue of wrong policies, wrong thinking, blunders, national obtuseness and indifference.

The folly began in World War II when indiscriminate U. S. draft policies, which no other modern nation even then espoused, practically gutted the production of future scientists and engineers. Not even the heavy graduating classes of the immediate postwar years made up the four-year-long drought and deficit.

When the present emergency arose to increase the armed forces, the military seemed disposed to commit all the errors of World War II over again. A blanket two-year hitch of service was pressed for all eighteen-to-twenty-six-year-olds, which would have turned the present scientific manpower shortage into a bone-dry drought and decimated the production of young technicians through the middle fifties. Various remedies were proposed, among them a plan by the Scientific Manpower Advisory Committee. Its key proposal was a powerful, over-all board to rule and husband the nation's scientific manpower.

If the military made good use of the engineers it called or drafted, there would be less basis for criticism. But one Army camp surveyed had sixty engineers, largely N. C. O.'s and privates, spending half their time on the endless, pointless household drudgery of army encampments. And of the 19,000 young engineers, or half of last June's graduating class called into service this year, the bulk are occupied not in engineering but in the medieval nonsense of strictly military service.

Meanwhile, industrial research and development, the real base of modern military power, is already being limited not by dollars but by lack of technical men.

To top all other boners, early in 1950 a statistical chart slipped out of the Bureau of Labor Statistics, which indicated that there was a growing oversupply of engineers for available jobs. This release naturally was widely circulated, posted in classrooms, and picked up by the press, notably by such pervasive national magazines as *Life*. And this at a time when conditions were running exactly the opposite. Since engineering school enrollments usually follow closely on economic demand, many engineers believe that this false report, discouraging students, is partly responsible for the slim engineering classes now coming up. The BLS was led into its egregious blunder largely by a group of midwestern university advisers, bemused by the number of G. I.'s then swamping engineering schools and unable to see how they could all find employment.

Nothing can bring you peace but yourself. Nothing can bring you peace but the triumph of principles.

—*Emerson*

To the engineer, all this attention is both belated and unfamiliar. The scientist has managed to hoist himself in the public eye, but the engineer is still confused with railroad enginemen and other oil-begrimed machine tenders by many people, radio commentators, and Congressmen. The stock engineering figure on a slightly higher plane is Gregory Peck in shiny boots and whipcord breeches, waving his arm over a transit, bossing some stupendous construction. Only by repeated beatings over the head have draft boards been moved to consider engineers occasionally important enough for deferment. There is, in fact, a great deal of confusion and obfuscation over engineering's exact role in society.

This is all the more surprising in a country that leads the world in engineering. With only 6 per cent of the world's population and only 5 per cent of its land area, the U. S. accounts for roughly half of all the world's industrial production. This pitch of productivity new in history and rising at the rate of about 3 per cent a year since 1900, is the achievement of engineers working endlessly to devise and improve the tools, methods, materials, and end products of mass production.

For this, the engineer is strangely anonymous. The throngs moving through, over and around some of his greatest works, such as Grand Central Station in New York City, neither know nor are curious about the men who conceived and built them. To achieve fame an engineer must generally become something else. George Washington and Herbert Hoover are prime examples.

Though supply and demand are now beginning to change this, the lack of recognition and concomitant lack of rewards have not made the profession a lodestone. Perhaps much of the reason for all this lies in the history and development of engineering. Unlike the experimental scientist, who sprang from the brow of the Renaissance as an almost entirely new phenomenon, the engineer traces directly back to earliest times, never far removed from the hard manual labor and skilled artisanship by which man slowly built his dominance and powers.

Before any lasting solution to the scientific and technical shortage can be found, a long-needed shift in national attitude may be required. The U. S. came out of the last war with an intelligentsia tired of the mechanical riot, the overpowering complexity and potential destructiveness of science, and ready to call for a showdown in favor of the more peaceful liberal arts. This was heightened by attacks upon science and scientists, both political and professional, and by attempts to reinstate medieval classic studies to their old position of dominance. Yet the stark fact is that all postwar warnings of an overemphasis on the physical sciences or

an oversupply of scientists and technicians have been not only unwarranted but harmful, and the nation must now deal with a malaise that is running deep.

Enrollments in chemistry, for instance, are beginning to drop below prewar levels, in spite of the fact that the industry has had a 400 per cent growth since 1940 and is still growing. General Aniline & Film used large advertisements last spring to plead with high-school students to consider the great growth and rich rewards of the chemical industry in choosing a career. Enrollments in physics, following an initial postwar spurt, are likewise down. The fact is that much of the reason and glamour have been departing from the pursuit of the sciences, which are nothing if not directed toward the betterment of man. While science and engineering have been held up as less and less honorific pursuits, society has been directing them ever more thoughtlessly and persistently to destructive ends. Those are not the ends to fire the imagination of youth. Some rehabilitation of the idea of progress is needed—a vast technical program for raising the living standards of neglected countries, for instance, to offset the vast military build-up—if science is not to wither and endanger the life of society.

A dictatorship has no such uneasy problem or conscience. The U.S.S.R. is training by fiat some 100,000 technicians a year, and directing their employment as it sees fit. The U. S. being no dictatorship, must find ways social, voluntary and democratic to beat that qualitatively if not quantitatively. That is why *Chemical and Engineering News* solemnly warns the country: "The fast approaching bottleneck of too few scientists and technologists can well be the most efficient weapon possessed by Stalin and the Politburo."

LAWRENCE P. LESSING,
Fortune, September, 1951.

HOME—THOUGHTS FROM ABROAD

In the first industrial revolution Man acquired and mastered steam motive power, and developed the machinery and processes it created. Subsequent technical progress, notably in electricity, chemistry and internal combustion engines, accelerated the pace and demanded quicker human thinking and adjustment.

A second industrial revolution is upon us. Gas turbines, electronic and chemical advances, and the prospective harnessing of atomic power, will usher in a higher and faster industrial era in which finer and more revolutionary technique will predominate. An immeasurably enhanced and dynamic role in this highly technical society will inevitably fall to the engineer.

During the earlier industrial revolution—the apprenticeship of modern technical development—the function of the engineer, though fundamental in shaping the new pattern of everyday life, was not comprehended in its full professional significance by the layman—not even by the majority of engineers!

Although he is the architect of technical transformation and his activities have become more integrated with every aspect of advance, the engineer's professional stature has not marched—particularly in Britain—with events. It is ironical that this backward condition should exist in the pioneer land of engineer-based development, in glaring contrast to the position abroad, and to other professions even at home. Switzerland, for example, has found that registration of engineers (as doctors are registered in Britain) results in the creation of a national technical core the excellence of which is universally admitted and continually rising. This is of tremendous importance in a small country which must make the most of limited natural resources. Nowhere in Europe is the status of the professional engineer so high.

It is easier to know mankind in general than man individually.
—*La Rochefoucauld*

In Britain the loosely used word "engineer" is almost devoid of professional significance. The popular misconception of the professional engineer in this country gives rise to that casual regard, not only by the general public but by various administrative individuals and bodies, which no self-respecting professional man can indefinitely tolerate.

Only the professionally conscious engineer can correct the perspectives of others with respect to himself, by belonging to a "pressure group," the essential means of asserting identity in this highly organized modern world. He has in the past by default contributed to the present position. Absorbed in preoccupation with *things* and *theories* rather than *people* and *atmosphere*, his thoughts lie more to turning a steel bar than a telling phrase.

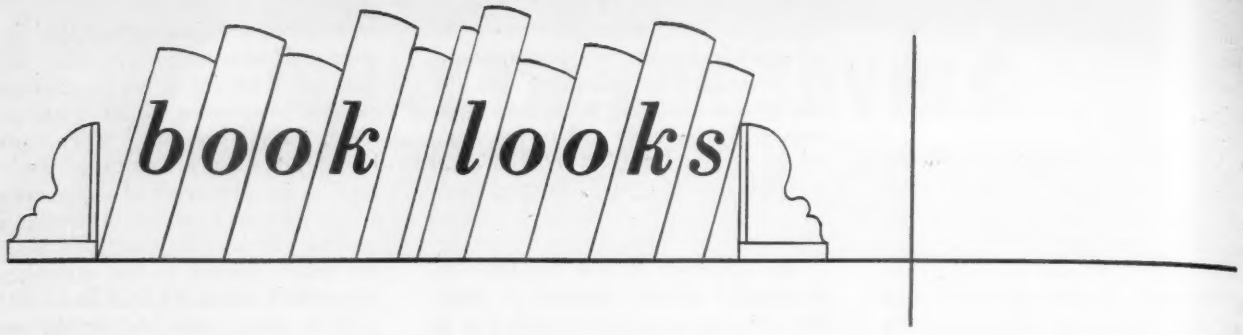
By acquiring a broader humanistic basis, the engineer, as the key figure in this technical epoch, can become even more universal than the non-technical classicalist in the past. Gladstone, secure in his political and classical eminence could without a blush for his ignorance when shown by Faraday his invention of the dynamo—the precursor of a new era in-human advancement — ask what use could it serve! The scientists' sarcastic reply, geared to the statesman's scientific limitations, that he might be able to *tax* it, was lost on the great Victorian.

The conception that the scientist and artist are inevitably antithetical has acquired strong roots. This belief has to some extent colored the engineer's attitude to the "humanities"; but awareness is growing of the interdependence of *use* and *beauty*. The poet's vision was leaping in that direction when Rupert Brooke sang of "the keen impassioned beauty of a great machine." Imagination as well as knowledge, a far-ranging vision, is as indispensable to the creative engineer as to the artist. That eminent engineer Professor Unwin, recommended Professor Kennedy's definition of the engineer, "an engineer is a man who is continually being called on to make up his mind. It may be only as to the size of a bolt, it may be as to the type of the Forth Bridge."

In all branches of industry direct employment of professional men is increasing. The most rapid acceleration of this trend is in the science-based industries, *i.e.*, those with a definite laboratory research basis, as in the chemical and electronic field, where new substances and processes are being produced. Next come industries less directly founded on the laboratory, but becoming more dependent on invention and research, as in by-product offshoots from other activities, e.g., oil-refining, distilling, coal processing. A third group is concerned in consulting science rather than in seeking its constant partnership, as in heavy mechanical engineering and ship-building: this too is steadily enlarging its intake of professional engineer-executives to make the most of modern advances. Even the oldest industry of all is at last turning to the engineer. The modern farm is becoming the engineer's job.

Productivity in all spheres is spotlighted today, as the key to cultural advancement. Scarcity of manpower in relation to this need underlies the social importance of the engineer. The engineer will mould the future. With an artist's vision and thought as fleet as time, he can lead the race.

WILLIAM BOYLE, Chairman, Scottish Branch, Engineers' Guild,
The Journal of the Engineers' Guild.



Title: The Loyalty of Free Men.

Author: Alan Barth.

Published by: The Viking Press, New York. Price: $3.00.

The main theme of *The Loyalty of Free Men* is an examination of the conflict between our desire for security against the Communist threat and our traditional concepts of liberty. While fully cognizant of the undesirability of American Communists, Barth feels that we may be abandoning large segments of our basic freedoms in a frenzied attempt to escape from this one-thirtieth of one per cent of our population. He first deals with congressional investigations; then the loyalty and security-risk programs, and other methods for controlling government employees, including scientists and last, the question of insuring the loyalty of teachers.

This is a sensible, realistic and essentially conservative discussion of the present cult of loyalty and its effects on American public and private life. Alan Barth, who is widely known for his editorials in the *Washington Post* newspaper, has found what is at once a new and a very old approach to the loyalty problem. He writes from the standpoint of American tradition as set forth in the Constitution and expounded by a long line of American jurists beginning with Chief Justice Marshall. He explains why he believes that our present lawmakers and administrators are departing from the spirit of the law.

Among the topics that Mr. Barth discusses at length are the real Communist threat and how to deal with it in peacetime and wartime; the dangers inherent in punishment by publicity; the treason trials and their lessons; the practical operation of the loyalty program; its effect on scientific research; loyalty in the universities; and the limitations of the Federal Bureau of Investigation as an instrument for determining loyalty. He illustrates these topics with case histories, including much unpublished material from government loyalty hearings. He also suggests a practical standard for hiring government employees, one that would encourage abler men to enter the field of public administration, while providing for freedom as well as security.

The Loyalty of Free Men is an "American" book in the most cherished sense of the word. Only if concern for the continuance of the American ideals which have made and preserved our country is a subversive idea, can Mr. Barth be called a radical. While he is by no means for "white-washing" subversives, he suggests a course of wisdom and dignity based on American tenets to preserve our national security.

But loyalty and national security, as Mr. Barth suggests, are not subjects to be dealt with by certain individuals and not others. It is our continuing duty as free citizens to continually examine the policies of our government and make sure that we are not losing basic rights and privileges. A high-minded government, dedicated to the principle of the freedom of the individual, will automatically have the loyalty of free men.

Title: Seven Decisions That Shaped History.

Author: Sumner Welles.

Published by: Harper & Brothers, New York. Price: $3.00.

Writing with unquestionable authority, former Under Secretary of State Sumner Welles tells the inside story of seven crucial diplomatic decisions, made during the war years, that played a related and incalculably important part in determining the history of the world. In a final chapter of particular and compelling importance, he criticizes with frankness the mistakes in U. S. foreign policy during the past five years, and gives his opinion of what our policy should be today, both in Europe and the Far East.

The seven decisions are those about which criticism and controversy have gathered most thickly. Here Mr. Welles tells exactly how and why each one was made—how the problem presented itself at the time, what information was available, what factors were involved, and who were the people responsible. In the process, he analyzes with devastating precision the misinterpretations, misconceptions, and the often deliberate misstatements of fact that befog the issues involved. Reviewing the series of events that form the history of our foreign policy, he also makes clear his conviction that a large number of the great decisions made during the war years would have had successful results had they been carried out with vigor and intelligence during the postwar period.

The issues with which Mr. Welles is here concerned are:

1. The rejection by Mr. Hull and Mr. Chamberlain of F.D.R.'s plan to use American influence to arrest the onrush of World War II.

2. The bitterly controversial decision to recognize the Vichy government.

3. Our policy toward Japan before Pearl Harbor.

4. F. D. R.'s decision to uphold Welles' demand (over Hull's objection) that hemisphere unity must be maintained at all costs.

5. The decision to postpone settlement of political and territorial problems until after the war.

6. F. D. R.'s decision to grant Stalin's Far Eastern demands at Tehran and Yalta.

7. The decision to set up a functioning United Nations organization before the end of the war.

This is a searching and revealing account of certain crucial phases of American foreign policy and the way in which decisions made some years ago are affecting events today. In its new information and outspoken approach, in its revelations of behind-the-scenes diplomacy, it is a book of lively and urgent interest, written by a statesman whose vision and judgment events have vindicated.

For the thoughtful professional engineer who is interested in causes as well as effects, *Seven Decisions That Shaped History* will help him to formulate his own ideas about American foreign policy, past and present.

With Our Members . . .

Wisconsin Society Meets For Fifth Summer Conference

The Fifth Summer Conference of the Wisconsin Society was held September 7 and 8 at Eau Claire. A special ladies' program was planned which included luncheons and a sightseeing trip.

On the opening day of the meeting, a Board of Directors meeting was held, followed by a reception which featured entertainment, refreshments and buffet.

On Saturday, a U. S. Bureau of Reclamation motion picture was shown, "Corralling the Colorado." Following the showing of the movie, F. T. Agthe, President, WSPE, gave the opening address, which preceded a business meeting of the Society. Functional group meetings ended the morning's activities.

In the afternoon, a luncheon was held at the Eau Claire Country Club, at which G. V. Rork, President, Northern States Power Company of Wisconsin, addressed the group. Following the luncheon golf and sightseeing were scheduled for the members' enjoyment.

An informal banquet was held on Saturday evening, with Professor B. G. Elliott, Chairman of the Mechanical Engineering Department of the University of Wisconsin, serving as Toastmaster. Dr. Paul E. Klopsteg, Director of Research, Northwestern Technological Institute, spoke to the group on "Science and Engineering in World Affairs," and the Four Corners Barber Shop Quartet provided music for the occasion.

Harrisburg Chapter Sees Demonstration On Electric Science

The Harrisburg Chapter of the Pennsylvania Society met on September 17 at the American Legion Home to see a demonstration of electrical science which was sponsored by the Westinghouse Electric Company.

The program was put on by a touring demonstration group, with a staff of approximately seven men and a display of the latest electrical developments.

A Ladies' Night meeting is planned by the Chapter for October 18 at the Penn-Harris Hotel.

Pennsylvania Chapter Hears Address on Modern Mining Equipment

The Midwestern Chapter, PSPE, met on September 8 at the Penn-Grove Hotel in Grove City, Pennsylvania, to hear Mr. James Beeney, Assistant Research Engineer, Joy Manufacturing Company, discuss "Use of Mechanized Equipment in Present Day Mines."

Mr. Beeney is a registered professional engineer in the state of Ohio, and is presently affiliated with A. S. M. E. and the Northwestern Pennsylvania Engineers Society.

Fort Worth Chapter Of Texas Society Hears Two Speakers

The Fort Worth Chapter of the Texas Society met on August 16 at the Cattlemen's Cafe for a dinner meeting.

Two speakers were included on the program: Mr. J. Rob Griffin, who spoke on the subject "Facts About the Forward Fort Worth Program"; and Mr. T. R. Buckman, Traffic Engineer, City of Fort Worth, who discussed Fort Worth's traffic problems generally.

MISSOURI GOVERNOR SIGNS BILLS

The Honorable Forrest Smith, Governor of Missouri, is shown above as he signs two bills passed by the 66th General Assembly of Missouri. When these bills become law this month, they will bring up to date and strengthen Missouri's registration law for architects and professional engineers. The two bills received full support by both professions and represent a big step forward for members of these two professions by giving statutory recognition to qualifications of architects and professional engineers to practice. Protecting the people and property of the state from damage through incompetent or unlawful practice of architecture or engineering is the purpose of the law. Missouri's first registration law, enacted in 1941, is administered by a seven member board representing both professions. The two bills signed by Governor Smith contain suggested changes from the board. Interested witnesses to the signing of the two bills in the picture above are, from left: Fount Rothwell, P. E., Chairman, Legislative Committee, Missouri Society; Jefferson City; E. W. Carlton, P. E., Professor of Structural Engineering, Missouri School of Mines, Rolla; Bruce Williams, P. E., Chairman, Missouri State Board of Registration for Architects and Professional Engineers, Joplin; Huber O. Croft, P. E., Dean, College of Engineering, University of Missouri, Columbia; Governor Forrest Smith of Missouri; Don Fischer, Assistant Dean, School of Engineering, Washington University, St. Louis; Mrs. Clemmie V. Wall, Secretary, Registration Board, Jefferson City; John M. Schaper, Member, Architects' Division, Registration Board, Jefferson City; Clifford Wood, Executive Secretary, Missouri Society, Jefferson City.

Spectator Thrills Too Tame for Rochester Engineers

Roy Birkicht, P. E., and Richard Kramer, P. E., members of the Monroe County Chapter, NYSSPE, are both certified football officials. After several years of officiating at high school games, both men have now passed their examinations for college officiating, and have been working college games for the past two or three years.

Both men played football in college; Birkicht as a halfback at the University of Illinois, and Kramer as a fullback at the University of Rochester.

At the present time they can be assigned to college games as far south as Washington, D. C.

A pint today may mean a life tomorrow. See your local blood donor center.

West Virginia Chapter to Hear Former Representative

The Honorable Jennings Randolph, Assistant to the President of Capital Air Lines, will be guest speaker when the Fairmont Chapter of the West Virginia Society meets on October 19. Mr. Randolph served in the U. S. Congress for 14 years as a representative from West Virginia, and is a speaker of national reputation.

The Clarksburg and Morgantown Chapters are to be guests of the Chapter at the meeting, in addition to the Fairmont ladies.

Atlanta Chapter Aids in National Steel Scrap Drive

The importance to the defense program of an increased flow of scrap iron and steel to the mills so impressed the Board of Directors of the Atlanta Chapter, Georgia Society, that they voted to distribute one thousand copies of the Department of Commerce's booklet, "Scrap for Steel for Defense." The booklet has been mailed to the entire membership of the Society and to other engineers as a contribution of the Atlanta Chapter in support of the drive.

Support our Armed Forces. Join the Blood Donor Program today!

Minnesota President Names Hospital Committee Recently

Minnesota Society President Paul R. Speer is naming a five-man committee, with five alternates, to serve at the request of the Section of Special Services of the State Department of Health for adopting rules, regulations and standards for the licensing of hospitals.

S. L. Stolte, Past NSPE President, will serve as chairman. Work of the committee also will include adoption of minimum standards for construction and equipment. The ten men being asked to serve are engineers experienced in hospital design. Their recommendations will be submitted to the Advisory Board of the Department of Health and then to the Board of Health. Upon approval of these bodies, their recommendations will become the operating code for inspection of hospitals and related institutions.

Cincinnati Chapter Hears Basketball Coach on Fixes

The Cincinnati Chaper, OSPE, held a meeting at the Hotel Alms on September 10. The guest speaker for the evening was Mr. John "Socko" Wiethe, basketball coach of the University of Cincinnati, who gave an interesting talk on "Basketball Scandal."

A film of the Long Island University-U. of Cincinnati game was shown, and Mr. Wiethe pointed out several "fixes" that could be detected in the film, but were not discovered during the game.

Following the film Mr. Wiethe answered questions from the audience, after which the Chapter conducted a business meeting.

Piedmont Chapter Of South Carolina Hears Three Speakers

The Piedmont Chapter of the South Carolina Society met recently for a dinner meeting at the Civic Room of the Otteray Hotel in Greenville.

Speakers and topics for the evening included: Claud C. Cames, P. E., "The Engineer in Training"; Alec Crouch, P. E., "Greenville Slum Clearance Program"; and Chester E. Hatch, P. E., "Physical Properties of the Sun."

West Virginia Society Holds 18th Annual Meeting Recently

(*Photo on page* 23)

The 18th Annual Convention of the West Virginia Society, which was held on August 23, 24 and 25 at the Greenbrier Hotel, White Sulphur Springs, was outstanding both in attendance and interest. Inspirational talks and relaxation in the most delightful surroundings, with study and action upon a hard core of practical problems concerning the engineer combined to make up the program for the three-day session. One hundred and fifty engineers and their ladies attended the convention.

The meeting opened with an Engineers' Round-Up, held in the President's Room of the hotel. Following dinner, an Executive Board Meeting took place in the Greenbrier Suite.

West Virginia President Leslie C. Gates delivered the welcoming address to the convention the following day, and his talk was followed by a Chapter Presidents' and Secretaries' Conference. NSPE President L. L. Dresser spoke at the Past Presidents' Luncheon which was held in the Colonnades Room. A business session and meeting of the State and Nominating Committees took place in the afternoon. Throughout the day special activities were planned for the ladies.

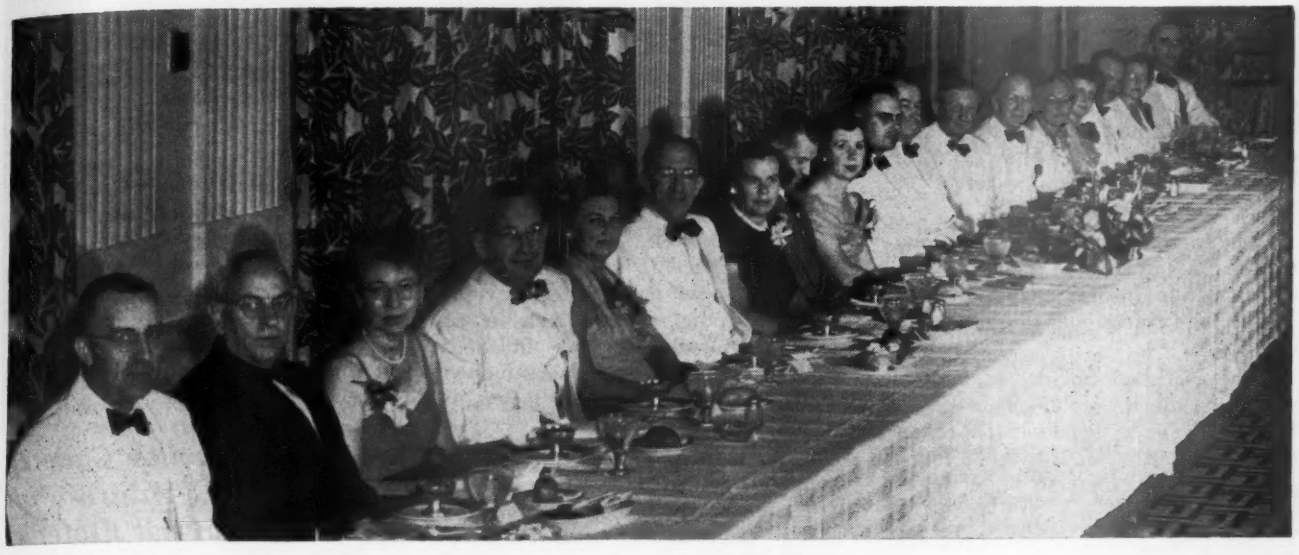
Extend the lifeline to our Armed Forces. Join the Blood Donor Program.

Dr. Henry G. Bennett, Administrator, Technical Cooperation Administration, Department of State, addressed the evening banquet, which was held in the auditorium. The banquet was followed by dancing.

The final day of the convention was devoted to functional group meetings and a business session in the morning as well as an address to the group by NSPE President L. L. Dresser. The concluding function of the meeting was a luncheon at which Mr. Thurman Sensing, Executive Vice-President, Southern States Industrial Council, Nashville, Tennessee, was the guest speaker.

A coffee hour and card games were scheduled for the ladies' activities on the final convention day.

WEST VIRGINIA SOCIETY HOLDS ANNUAL MEETING



One hundred and fifty engineers and their ladies attended the eighteenth annual convention of the West Virginia Society of Professional Engineers, which was held at the Greenbrier Hotel, White Sulphur Springs, in a three-day session which ended on August 25. Talks by national leaders and study and action on current engineering problems highlighted the meeting. A special ladies program was provided for attending ladies. The picture above, taken at the speaker's table at the annual banquet held on Friday night shows, reading from left to right, the following: O. J. Swanson, P. E., Second Vice-president, WVSPE, Gary; H. J. Wagner, P. E., Treasurer, WVSPE, Charleston; Mrs. H. J. Wagner; Harry G. Kennedy, P. E., National Director, WVSPE; Mrs. Harry G. Kennedy, Charleston; John D. Coleman, P. E., Chairman, Ladies' Auxiliary Committee, NSPE, Dayton, Ohio; Mrs. John D. Coleman; Paul H. Robbins, P. E., Executive Director, NSPE, Washington, D. C.; Leslie C. Gates, P. E., President, WVSPE, Beckley; Mrs. Leslie C. Gates; Dr. Henry G. Bennett, Administrator, Technical Cooperation Administration, Department of State, Washington, D. C.; L. L. Dresser, P .E., President, NSPE, Tulsa, Oklahoma; W. O. McCluskey, Jr., P. E., First Vice-president, WVSPE, Wheeling; Mrs. W. O. McCluskey; Mrs. A. C. Neff; A. C. Neff, P. E., former National Director, Ohio Society, Middletown, Ohio; Mrs. Ross P. Johnston; Ross B. Johnston, P. E., Secretary, WVSPE, Charleston.

Puerto Rico SPE Holds Annual Meeting At San Juan Recently

The Puerto Rico Society held its Annual Meeting on August 24 in San Juan at the site of the New Psychiatric Hospital for the Capital of Puerto Rico. Twenty-two active members and approximately 40 guest engineers were present.

Following the reports of Committee Chairmen, President Alberto Hernandez spoke briefly on some of the work done by the Chapter and explained the aims and purpose of the National Society. Expressing satisfaction at the work already done this year toward increasing membership, Hernandez urged each member's full cooperation in reaching a higher membership rate in the coming year.

Following the acceptance of seven engineers and two engineers-in-training as new members, the members inspected the construction of the new hospital and afterwards attended a luncheon.

District of Columbia Society Holds First Fall Meeting Recently

The District of Columbia Society held its first fall meeting on September 24 at the PEPCO auditorium in downtown Washington. Featured on the program was a motion picture "The Trail of the Rocket," which is sponsored by the Oldsmobile Division and describes a tour through a present day Oldsmobile Rocket Factory.

County Taxes Clarified for Texas Chapter

Judge James Kirkland was guest speaker for the September 20 meeting of the Sabine Chapter, Texas Society, which was held at the sub-courthouse in Port Arthur.

Judge Kirkland's topic was "The Tax Dollar," and his talk outlined the uses to which the taxpayer's dollar is put within county government. Kirkland is County Judge for Jefferson County.

Atlanta Chapter Helps in Setting Up New City Code

The Council of the city of Atlanta, Georgia, acted favorably on the request of Mayor William B. Hartsfield for the appointment of a committee to work with the Inspector of Buildings and the director of the Smoke Abatement Bureau in drawing up for adoption a suitable Heating and Ventilating Code.

W. R. Worrord, P. E., Inspector of Buildings for the city of Atlanta, commented: "Fortunately in drafting the Atlanta Building code, through the assistance of the Georgia Society of Professional Engineers, we were able to accomplish modern and up-to-date building regulations. I am certain that we can follow suit in drafting the new Heating and Ventilating Code. As usual, we will lean heavily upon the Professional Engineers in order to provide a modern Code."

They gave on Heartbreak Ridge—now you can give. See your local Blood Donor Center.

Nevada Society Offers Services To Governor

On August 7, the following letter was sent to the Honorable Charles Russell, Governor of the State of Nevada, by Robert W. Millard, P. E., President of the Nevada Society:

"Dear Governor Russell:

"The Engineering Registration Law for the State of Nevada is a vital piece of legislation insofar as the Nevada Society of Professional Engineers are concerned.

"The National Society of Professional Engineers, founded in 1934, has as its basic principle the representation and voice of the Professional Engineer through State Registration.

"For the past several years the Nevada Society has been instrumental in securing changes, alterations and additions to the Nevada State Law which makes original law more nearly a pattern of the model law, giving full consideration to conditions unique to the State of Nevada.

Join the Armed Forces Blood Donor Program.

"For this reason it was only natural that salient features of the law should come up for discussion at the Annual Meeting held in Ely the latter part of June, 1951. It was there pointed out, that the law now specifically states, that members of the State Board of Engineering Registration appointed by you as Governor of the State of Nevada, *cannot* succeed themselves at the expiration of their two year term of office.

"Since, therefore, you will have the opportunity of appointing several members to this Board, it was the wish of the Delegates assembled in Ely, that the services of the Board of Directors, Nevada Society of Professional Engineers, be made available to you should you desire their help or recommendations.

"For your information, a list of the Nevada State Society Officers and current committee Chairmen is attached to this letter. If we can be of assistance to you in any matter, please feel free to call upon us."

Respectfully yours,
ROBERT W. MILLARD
President, Nevada Society
Professional Engineers

Maryland Society Hears Dresser At Recent Meeting

"I boil a little every time I hear engineering referred to as a 'modest' profession," NSPE President L. L. Dresser told the Maryland Society at a dinner meeting in Baltimore's Park Plaza Hotel on September 18.

"We have been modest too long. We have retired to our work rooms with our books and our slide rules and have found answers to a lot of questions. When we have finished, we have passed the answers out to others who have taken all the credit for our work."

More than 100 Old Line State members turned out to hear Mr. Dresser, who outlined a program for giving engineering a new "personality."

Massachusetts SPE Holds Annual Meeting In Nahant Recently

The Annual Meeting of the Massachusets Society, held recently at the Thompson Club in Nahant, Massachusetts, was attended by more than 100 representatives from the Metropolitan, North Shore, Berkshire, Central Massachusetts and Connecticut Valley Chapters.

The business meetings of the various Chapters and the State Society preceded a social hour and the Annual Society Banquet followed. The Banquet was highlighted by the after-dinner address of Dr. Leonard Carmichael, President of Tufts College. In his speech, Dr. Carmichael stressed the dignity of the engineering profession and its ever increasing contribution toward the welfare of our national life and educational institutions.

Lehigh Valley Chapter Holds Past Presidents' Night

The Lehigh Valley Chapter of the Pennsylvania Society held a Past Presidents' Night meeting on September 28 at the Hotel Bethlehem ballroom in Bethlehem.

Featured speaker of the evening was Professor Paul B. Eaton who addressed the group on "Our Relations With the Chinese." Professor Eaton was sent to China by the U. S. Department of State for the years 1943-44 to help maintain China's industries in the war effort.

Galveston County Chapter Holds Dinner Meeting

The Galveston County Chapter of the Texas Society held a dinner meeting on September 18 at Bostick's Cafe in La Marque.

Dr. D. Bailey Calvin, Dean of Student and Curricular Affairs, Medical Branch, University of Texas, gave a short resume on recent advances in medicine, including major medical discoveries of the past 20 years, and their impact on the health and welfare of the human race.

Knoxville Chapter Hears Address on Civil Defense

The Knoxville Chapter of the Tennessee Society held its monthly meeting on September 24 at the S. & W. Cafeteria. The speaker for the meeting was Mr. John T. O'Connor, who addressed the Chapter on a Civil Defense Program.

The meeting was designated as "Oak Ridge Night," and engineers from Oak Ridge were cordially invited to attend the function.

Monroe County Chapter Hears Engineer on New N. Y. State Thruway

The Monroe County Chapter of the New York State Society held a dinner meeting on September 25 at the Hotel Rochester in Rochester.

Guest speaker for the occasion was Andrew R. Mulligan, P. E., who discussed the "Inner Loop" portion of the New York State Thruway.

Mr. Mulligan is District Engineer of District 4 of the New York State Department of Public Works.

New Jersey Society Holds Semi-Annual Meeting in Brielle

The New Jersey Society held its Shore Dinner and Semi-Annual Meeting on September 8 at the Manasquan River Golf Club in Brielle, New Jersey.

The Monmouth-Ocean Chapter was the host Chapter, and prepared a full day's program for members and their families, including games, golfing, swimming and dancing.

NSPE Committee Heads

Awards—A. G. Behling, 2326 S. 75th St., Milwaukee, Wis.

Budget—T. C. Forrest, Jr., Praetorian Bldg., Dallas, Tex.

Chapter Activities—Joe Williamson, Jr., P. O. Box 1431 Daytona Beach, Fla.

Constitution and Bylaws — Prof. William A. Oliver, Univ. of Illinois, College of Engineering, Urbana, Ill.

Education—Dean N. W. Dougherty, Univ. of Tennessee, Knoxville, 16, Tenn.

Employment Practice—Robert A. Blackburn, 3110 Koppers Bldg., Pittsburgh 19, Pa.

Ethical Practice—John F. Reynolds, P. O. Box 4442, Jacksonville, Fla.

Extension—Alfred J. Ryan, 1340 Glenarm Pl., Denver 2, Col.

International Relations — J. J. Loustaunau, 75 Pitts St., Boston, Mass.

Inter-Society Relations — Lt. Col. H. H. Hill, 4512 Wooddale Ave., Minneapolis, Minn.

Inter-Professional Relations — Dr. C. L. Emerson, Georgia Tech., Atlanta, Ga.

Ladies' Auxiliary—John D. Coleman, 2520 Elsmere St., Dayton, O.

Land Surveyor — S. A. Bauer, 1836 Euclid Ave., Cleveland, O.

Legislative — C. T. Shoch, 2129 Walnut St., Allentown, Penna.

Liability Insurance—A. G. Stanford, 96 Poplar St., N. W., Atlanta, Ga.

Membership—Harry G. Kennedy, 1307 Kanawha Valley Bldg., Charleston 1, W. Va.

National Affairs — Stephen G. Szabo, General Motors Corp., Detroit 2, Mich.

National Defense — Col. Chester Lichtenberg, 4624 Tacoma Ave., Ft. Wayne, Ind.

Publications—G. J. Nicastro, 200 Madison Ave., New York, N. Y.

Public Relations — C. G. Roush, 1014 Fairfax Bldg., Kansas City, Mo.

Registration — R. J. Rhinehart, 411 Main St., Pine Bluff, Ark.

Resolutions — DeWitt C. Griffin, 525 Central Bldg., Seattle 4, Wash.

Salaries and Fees—Ole Singstad, 15 Whitehall St., New York 4, N. Y.

Young Engineer — R. E. Allen, 1731 Auburn Ave., Dayton, Ohio.

Save a life—contact your local blood donor center.

Roush Announces Plans for 1952 Engineers' Week

"The Engineers' Week Kit for the 1952 observance will be mailed to all Chapters and Societies from National Headquarters on October 15," C. G. Roush, P. E., Chairman of NSPE's Public Relations Committee, announced recently. "This should enable every Chapter and Society to get to work immediately on their individual plans for the celebration," he continued.

Roush also announced the appointment of Mr. W. W. Perry, P. E., of the New York State Society as Chairman of the Engineers' Week Sub-Committee for this year, and urged all State and Chapter Engineers' Week chairmen to cooperate with him in every way possible.

"Engineers' Week affords the Society one of its best opportunities to inform the public of the value and contributions of the professional engineer to our way of life," Roush stated further.

"Now is the time for Chapters to appoint their Engineers' Week chairmen, so that they may begin to lay their plans for an effective program in their communities."

In addition to the new fifteen-minute radio script which will be sent out with this year's Kit, a tape recording of last year's script, "The Dream Builder", is available from National Headquarters for those Chapters who did not utilize the script last year.

Work has already begun on national-level publicity at National Headquarters, Roush said, "and from all indications, this year's celebration of Engineers' Week throughout the country should be a great success not only for the Society but for the engineering profession."

Missouri Society of Professional Engineers—15th Annual Meeting, October 18, 19 and 20. Statler Hotel, St. Louis.
Board of Directors, National Society of Professional Engineers—Fall Meeting. November 9 and 10. Kansas City.
Arizona Society of Professional Engineers—Annual Meeting. November 23 and 24. Phoenix.
Florida Society of Professional Engineers—Annual Meeting. November 29 and 30. Soreno Hotel, St. Petersburg.
Indiana Society of Professional Engineers—Annual Meeting. November 30 and December 1. Lafayette.

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News To Note

West Virginia

Mr. J. A. Millard, P. E., Chief Engineer, Charleston General Hospital, was the guest speaker at the September 10 meeting of the Appalachian Chapter of the West Virginia Society. The dinner meeting was held at the El Chico Cafe in Beckley.

Mr. Millard's subject was "The Hospital Engineer." Chapter members were urged to bring their friends of the medical profession to the meeting.

Illinois

The Capital Chapter held its Fall season "kick-off" meeting at the Mill in Springfield on September 25. After dinner a movie was shown and the meeting concluded with a business session.

Texas

The San Jacinto Chapter, TSPE, met on September 10 at the Ben Milam Hotel in Houston to hear State Senator Searcy Bracewell. Senator Bracewell is the state senator from the Houston area.

New Jersey

The Monmouth-Ocean Chapter of the New Jersey Society met on September 5 at the Crystal Brook Inn at Eatontown to hear Mr. R. C. Simpson, Manager, Industrial Relations Department, Gilbert Associates, Inc., discuss "Labor Relations and Their Effect on Professional Engineers."

Ohio

The Toledo Chapter met on September 18 at the Elk's Club to hear Nolan Boggs, Attorney, discuss the "British Welfare State." Mr. Boggs' address was based on his personal experiences and observations of his recent European tour.

Texas

The Galveston County Chapter met at the Directors' Conference Room of the Lipton Tea Company Plant in Galveston on August 20. A short business meeting at the plant preceded the tour, and iced tea was provided for the touring engineers.

Massachusetts

The North Shore Chapter of the Massachusetts Society met on September 27 to hear an address by Mr. John Agnew, Vice President of the First National Bank of Boston on "The Responsibility of the Professional Man to His Community." The meeting was held at the General Electric Auditorium in Lynn.

Ohio

The Cleveland Chapter met on September 21 at Tomlinson Hall, Case Institute of Technology, to hear Dr. Richard Wallen, Associate Professor of Psychology at Western Reserve University discuss "The Psychology of Engineers."

Pennsylvania

The Northeast Chapter held a dinner meeting at the Fox Hill Country Club, West Pittston, on September 21. Featured on the program was a motion picture entitled "The Life of a Salesman," which was produced by the Chevrolet Division of General Motors. A cordial invitation was extended to all non-member Registered Engineers and Land Surveyors to come to the dinner and attend the meeting.

Arizona

Professor John C. Park of the Engineering College of the University of Arizona has been appointed Dean of the College of Engineering. Park is a member of the Southern Arizona Chapter of the ASPE.

New York State

The Bronx County Chapter, NYSSPE, held a dinner meeting on September 13 at the Concourse Plaza Hotel. Following the dinner a discussion of the Greiffenhagen Associates Report on the reclassification of engineering positions in the Municipal Government was held.

California

The Bay Area Chapter of the California Society met on September 19 at the Palace Hotel in San Francisco to hear Mr. S. G. Worthington, Supervisor of Employee Activities, Pacific Telephone and Telegraph Company, give a talk on "Micro-wave Relay Transmission." Mr. Worthington's talk was accompanied by a demonstration.

Ohio

The Mahoning Valley Chapter of the Ohio Society held its annual picnic on August 18 at the Mahoning Country Club near Girard.

A softball game between the Chapter's engineers and E-I-Ts was one of the afternoon's highlights. After a series of games and contests, a fish fry and corn roast was held.

Texas

The San Jacinto Chapter met on August 13 at the Shamrock Hotel in Houston to hear guest speaker Curtis Morris, Vice-president of the Trans-Continental Gas Pipeline Company, discuss "Public Relations."

New York State

The Westchester County Chapter plans to have its Annual Dinner on October 23 at the Glen Island Casino, New Rochelle. Max L. Vogel, P. E., and Vincent G. Terenzio, P. E., are handling arrangements.

California

The Los Angeles Chapter met on August 14 at the Mayfair Hotel in Los Angeles to hear Robert Tripp discuss "Jets, Rockets and Rocket Propelled Aircraft." All neighboring Chapters were invited to attend the program.

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Profession's Future

(*Continued from page* 14)

taken as a slap at teacher education. That professional group like engineering is striving to do an ever better job. They deserve help and not criticism of those who know little about their efforts.

If more young people could go to college, engineering would be helped. Did you notice, however, in figures given a few moments ago, that only 50 per cent of the boys entering engineer schools completed the course?

This indicates inefficient methods either in admission or in teaching the boys once they are in the school. This kind of record belies a profession that has prided itself on efficiency in all it undertakes.

The rate of drop-outs and transfers from engineering to other pursuits is a great waste of dollars and manhours, not to mention the blow to the morale of the boy who does not like or cannot succeed in engineering education.

To overcome this waste, we must work together—you as engineers and

It won't hurt you to give a little when it means so much. See your local blood bank.

I and my colleagues in engineering education as educators. Here again, you as the professional counterpart in industry of the teachers in engineering colleges can be of greatest assistance. Perhaps you can encourage the use of aptitude tests that will predict a greater measure of interest and success in your profession as a prior condition to entering training for it. You can urge, in fact demand, a teaching procedure that pays more attention to the laws of learning and less to the outmoded Corliss engine, to use an outlandish example. The engineer in selling knows the value of the psychological approach. Perhaps he can suggest the usefulness of the same subject to the teacher in engineering without encountering the charge of interfering with the latter's academic freedom.

There certainly should be a place for the study of human relations in the engineering curriculum. Engineers probably direct the work activity of more people than any other professional group. Little attention is given in our schools to this activity of the engineer. If the engineer cannot conduct his human relations successfully, his *other* technical skills may be wasted. By studying the curriculum of the engineering college and holding it up to the light of your own experience, you can, better than I, suggest where it is threadbare. The patching that may be needed you will be in an authoritative position to suggest. A few hours spent cultivating the confidence of the professor of engineering and allied subjects may reward you richly in the quality of the neophytes that you will employ from the classroom of the same pedagogues. Do not think of these men as persons entirely without an understanding of practical problems. The University is not the ivory tower that it is too commonly thought to be.

Two other proposals offer possibilities for the making of much-needed professional engineers. *The first*, is to bring the existing professional engineer to his optimum usefulness by in-service education. Here again the University of Delaware and other similar institutions are your partners. The University of Delaware has done pioneer work in this respect, and will endeavor to improve such opportunities in this community.

The second, is to train up to professional levels people of sub-professional training who have native ability and ambition. To help people to climb the ladder of success is in keeping with American tradition. Is this heresy? I am not suggesting lowering standards or breaking down the professional character of engineering. This will not be necessary if we work together. The apprenticeship system of education has always had much to recommend it. You as masters must always be good teachers. There are formal courses that are needed. We will offer such courses after work. Thus we may help to make much of your manpower more useful by bringing them up to professional standards. It is to be hoped that the University of Delaware will eventually be able to offer a complete engineering education to men already on the job but who want to become professional.

Let us see to it as engineers and educators that the opportunity exists in each state for every boy or man to acquire a good professional training in engineering if he desires it. He may proceed to this education directly from high school or on his own time after he completes his 8 hour day in industry. Let us see to it, however, that these would-be engineers are not kept from licensure by artificial hurdles erected by either of us. To do so is a disservice to individuals, but more important, it is a disservice to the country which has already provided so much opportunity for us.

Engineering education is our mutual interest. It is also our common challenge to pull in double harness for the national safety and well-being.

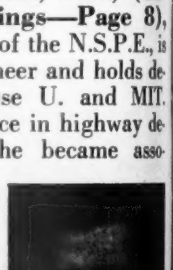
OUR AUTHORS

Dr. John A. Perkins, (You Can Direct Your Profession's Future—Page 12), the twenty-first president of the University of Delaware, assumed office on Nov. 1, 1950. Dr. Perkins had been assistant provost at the U. of Michigan.

A graduate of Michigan, Dr. Perkins received his M.A. and Ph. D. degrees from that institution. From 1939 to 1943 he was a political science instructor at Michigan, and then he joined the U. of Rochester. Later he served with the International City Managers' Association, and in 1946 he was appointed budget director for the State of Michigan. He returned to the U. of Michigan in 1949.

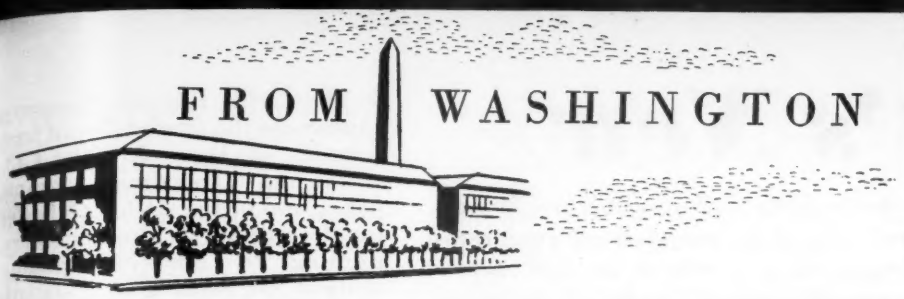
If you're a red-blooded American, prove it! Join the Blood Donor Program.

Paul H. Robbins, P.E., (Engineers With Wings—Page 8), Executive Director of the N.S.P.E., is a professional engineer and holds degrees from Syracuse U. and MIT. After field experience in highway design and layout, he became associated with the Pittsburgh Bridge and Iron Works leaving there in 1937 to join the engineering staff at Cooper Union.



In 1941 he joined the Executive Office of the Mayor of N.Y.C. as consultant on engineering training. During the war years, he served as Director of Training for the huge New York Port of Embarkation.

Mr. Robbins joined the Society in 1946.



FROM WASHINGTON

By
Arthur R. Woods,
N.S.P.E.'s Legislative Analyst

THE SALARY STABILIZATION BOARD HAS SELECTED THE ENGINEERING PROFESSION as an area for a pilot survey cutting across all aspects of salary regulation. A recent SSB report recognizes that salary stabilization for engineers, in addition to being a problem in its own right, is also closely related to general problems of national manpower policy. Adjustments, if any, based on the survey are to come from SSB rulings, or from changes in the Defense Production Act.

CERTAIN CHANGES IN THIS ACT MAY BE ON THE WAY, but adjournment is too close for action this year. At least one Senator, however, is exploring legislation to bracket professional engineers with doctors and lawyers, i.e., **to provide exemption from SSB control for engineers engaged in the practice of their profession while in the employ of engineer principals or firms similarly engaged.** This legislative road, while possible, is inherently time-consuming and difficult.

BEST CHANCE FOR RELAXATION OR MODIFICATION OF SSB RULINGS SEEMS TO LIE IN SSB ACTION. Well informed sources, close to SSB, confidently expect more equitable provisions governing **engineers as soon as all the facts are in.** Although not beset by the hazards and delays of legislation, this approach, too, will take some time to work out. **Action is highly unlikely until the projected survey is completed and digested.**

MEANWHILE SOME SALARY ADJUSTMENTS ARE POSSIBLE UNDER EXISTING REGULATIONS. Chief among these, in addition to the long-standing authorized overall 10% increase, **are the bonus, and the merit and length of service increases.** Bonuses are authorized, generally speaking, where there is either a written plan or a well-established history dealing with such payments. The amount in the bonus "pot" may not exceed that set up by the plan or established by the history, and no single bonus may be greater than the largest one paid during the base period.

MERIT AND LENGTH OF SERVICE INCREASES ARE IN GENERAL LIMITED by being payable from an amount **not greater than 6% of the SSB controlled payroll for a given year.** There is some latitude in how the sums may be distributed. **ADDITIONAL INFORMATION, OR SOURCES FOR ADDITIONAL DETAILED INFORMATION MAY BE OBTAINED FROM WASHINGTON HEADQUARTERS NSPE.**

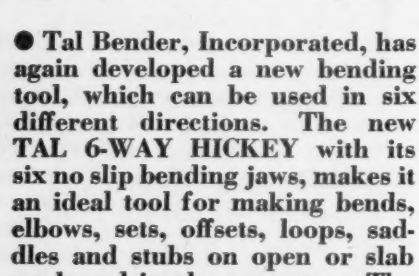
THE DEFENSE PRODUCTION ADMINISTRATION has recommended a set of standard design practices for use **by engineers and architects in the construction industry,** adopting at the same time a general program for the conservation of scarce materials. This action is based on National Production Authority findings set forth by specialists from 17 Federal Departments and Agencies. NPA is considering an amendment to its Controlled Materials Plan 6 to incorporate the recommendations suggested. **The seven design standards adopted by NPA are described as being "good practice, considered acceptable to most engineers, architects, building officials, and municipalities."** They cover the fields of structural steel, reinforced concrete, lumber, plumbing, electrical work, and related construction activity.

MUCH HELPFUL INFORMATION CONCERNING THE DEFENSE PRODUCTION PROGRAM is to be found in the Defense Production record, published weekly, and available through the **Government Printing Office for $2.50 a year.** It offers a convenient and understandable guide to regulations which are sometimes difficult and confusing.

What's New

As a service to our readers, this column will describe briefly new product developments of general interest to professional engineers. For further information concerning these products, we will appreciate your filling in the coupon provided for this purpose, and mailing it to the American Engineer.

● Tal Bender, Incorporated, has again developed a new bending tool, which can be used in six different directions. The new TAL 6-WAY HICKEY with its six no slip bending jaws, makes it an ideal tool for making bends, elbows, sets, offsets, loops, saddles and stubs on open or slab work and in close quarters. The stub hole is a new feature devised for bending or straightening conduit protruding from concrete floors or walls.



The long safety neck extends into the pipe handle, making this tool danger proof against accidents caused by the pipe handle breaking. The sure grip jaws are another added safety feature against the hazard of the pipe slipping during the bending operations. *Number 1.*

● Publication of a new 24-page bulletin which illustrates and describes various sizes and types of Nordberg Mine Hoists is announced by the Nordberg Manufacturing Company.

Nordberg Mine Hoists are built in cylindrical, conical or cylindro-conical, single or double drum designs of the conventional or tandem type to meet specific hoisting requirements.

Bulletin 190 shows with installation photographs the application Nordberg Hoists have in coal and ore mining operations both in the United States and throughout the world. Descriptions of these installations give pertinent engineering data on the hoists' operation. *Number 2.*

● An ingenious universal screw vise that instantly clamps round, tapered or irregular objects has just made its appearance on the market. Nothing like it has ever been made, according to the Swedish concern producing the product, called the "Sevo" vise. Its jaws consist of a series of machined and ground flat plates which hinge or swivel in any desired direction to coordinate with the shape of the held object.

These jaws are so designed that they can be moved in relation to each other, and the work piece can rest on a contact surface underneath. By turning the main screw the locking jaws position themselves and can then be locked to retain their directional position. Unlike conventional vises, the tightening screw requires only a slight turn, without imposing a heavy torque, to tightly grip the object. When filing, drilling or shaping objects, the worker can save much time by the quick and universal action of the Sevo.

The vise jaws are made of precision ground Swedish steel. The distance between jaws is 2½ and 5 inches, in two sizes. De Wilde-Jones, Inc., are the distributors. A bulletin giving details is available. *Number 3.*

● A new reinforced felt tape with a pressure-sensitive adhesive back has just been announced by the Products Research Company. This new felt product, known as Kling Felt, does not require a paper or other separation material between layers and, as a consequence, can be applied very rapidly.

Uses for this new adhesive backed reinforced felt include rattle and squeak deadening; sealing against dust, wind, fumes and foreign materials; as a thermal insulator; for vibration and shock cushioning in fragile crating and on machinery; for scratch protection and many other protective applications. Kling Felt's pressure-sensitive adhesive back eliminates the need for gluing or tying. Finger pressure will make it stay put on overhead and vertical positions until forcibly removed.

Further information is available in the new Kling Felt Engineering Folder No. KF 1000. *Number 4.*

● The Orbit Electric Company announces the availability of free samples of Dylewski *ARKTAN* arctangent coordinate graph paper and of the *ARKTAN* bulletin describing its use for curve plotting in scientific, mathematical engneering and statistical analysis.

ARKTAN Form 1235 has one arctangent scale and one linear scale; ARKTAN Form 1236 has doubt arctangent coordinates. Each form is available on 8½ x 11 tracing paper in packages of 20 sheets.

The use of arctangent coordinates permits the plotting of uninterrupted curves of data having values ranging from plus infinity to minus infinity and including zero as well. Most asymptotic functions become approximately linear in this coordinate system. Typical examples of applications are the plotting of reactance functions, radioactive decay curves, and heating and cooling curves. Extrapolation to zero and infinity and interpolation are easily accomplished. *Number 5.*

● The new pump operated Ohio Draw Bar pulls ½ inch to 4 inch size holes in sheet metal, switchgear housing, outlet boxes—without manual exertion; will not warp, break, tear or distort metal; eliminates danger of short-circuiting adjacent wires on conduit box installations.

Thirty pound pressure on handle produces 12,000 lb. pressure on cutting surfaces . . . cuts a clean, smooth-edge hole in less than a minute . . . without accident hazard to operator or equipment. The Ohio Draw Bar uses cutters now standard for hand operated knockout punches. The Ohio model simply replaces the bolt, thereby eliminates the hazards and manual exertion of laborious hand operated equipment.

Patterson Equipment Company markets the Draw Bar unit completely assembled and packed in a compact, readily portable metal carrying case. Total shipping weight is approximately 17 lbs. *Number 6.*

● Amazingly simple and novel, the new Aerial Photo Rule, without reference to tables and old style calculations, by means of five simple scales gives instant answers to types of problems like these: comparative size between objects on the ground and in a photograph; ground feet covered in flight per inch of photograph; speed at which image moves under camera lens; image size; and the determination of the minimum altitude at which a plane must fly at a given exposure time to give adequate coverage on film.

Designed as a double-purpose rule by the Aerial Photo Division, U. S. Air Force, the rule bears on one side 1) an Altitude Scale, 2) a Focal Length Scale, 3-4) two Image Size Scales, one reading in feet and one in centimeters, 5) a Ground Size (feet scale) for settings in either M. P. H. or Knots.

On the reverse side the rule bears L, A, DF-CF, CIF, T, S, C-D, DI, K for general computations. Made of non-warp light metal, white surface, needle-sharp black graduations. Available through Pickett & Eckel, Inc. Boxed completely in leather case with manual in two sizes. *Number 7.*

● A new booklet of interest to map and chart makers has just been announced by Monsen-Chicago, Inc., typographers. It is the Monsen *Trans-Adhesive (reg.) Map Type Specimen Book*, the first ever published. It is for use by persons who prepare graphic line material for reproduction: maps, charts, graphs, diagrams, exploded views, etc.

The Map Type Book shows examples of well over one hundred styles of type. Each face is actually displayed in all sizes from 6 point to 24 or 36 point. Several pages of "Quick References" are also provided; with these you can visually compare many faces in full size, 20% reduction, 25% reduction, 33⅓% reduction or 50% reduction. The book points out that correct accents and characters can be supplied for most foreign languages. In addition, it demonstrates how signs and symbols can be made to order.

Monsen Map Type is designed to remove the slow, tedious process of applying printed or lettered placenames to maps. It eliminates the need for costly hand lettering, and avoids the complications of applying small typographic detail with paste or liquid cement. The Map Type is printed on the under side of the sheet in opaque black, white or colored inks. A stroke of a stylus (furnished) cuts free the words you wish to mount. Square edges aren't necessary, because only the opaque printing shows. Lines beneath the acetate show through clearly, and reproduce with exactly the same clarity as all others. Only the inked portions are opaque. *Number 8.*

For additional data on these products, fill out the coupon below and mail to the AMERICAN ENGINEER.

● American productive genius has created a new building material which promises relief for the housing pressure in the face of possible increases of controls on critical materials. Known as "Duracrete," the new material makes facing and backing blocks or can be poured directly for walls, and likely will make an important impact especially in the small-house building field.

Here are some of the potentialities of the use of Duracrete: 1. Makes possible construction without use of critical materials. 2. Allows for a 30% to 35% reduction in building costs. 3. Reduces labor costs (a small house can be built by three men). Shortage of manpower will not affect production. 4. Requires no lumber below ceiling beams, except for doors and windows. 5. Facilitates absolute uniform distribution of heat. Common iron stove pipe is used for slab heat and heat goes through 30% voids, including partitions and walls.

Manufacturer of the new material is Durastone Faced Products. Expansion plans for the expanding company call for the granting of building and distributing franchises throughout the United States. *Number 9.*

● New heavy-duty weatherproof junction boxes made of non-corrosive case aluminum are announced by the Stone Manufacturing Company, and include a variety of covers and fittings for universal use on almost any outdoor wiring or lighting job.

The box itself has four hubs tapped ½" IPS, is provided with or without mounting lugs, has a flat aluminum cover plate sealed with a heavy cork gasket and a separate cast aluminum cover tapped ½" IPS to take standard lamp holders for the 150-watt, 200-watt and 300-watt outdoor weatherproof reflector bulbs now available as standard stock from all major lamp bulb manufacturers.

Used with lamp holders, and mounted on walls where buildings form boundary lines, the unit is reported especially effective for property-line lighting, for protective floodlighting of areas between buildings, loading platforms and areas where pilfering, sabotage and trespassing are best discouraged by an encircling wall of protective light. All units fully UL-approved. *Number 10.*

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Letters

(*Continued from page 6*)

to the lack of knowledge of the young as to the area of our profession. The only way we will ever make our profession known, as it must be, is to let our young know for what we stand. I do not duck the engineer's responsibility to tell the young of our profession. I merely ask how can we get a knowledge of our profession to our youth? How many guidance officers in the high schools are engineers? How and from whom do they gain their meager knowledge of our profession? How many do you know who have gone to an engineer for a knowledge of our profession? How many engineers do you know who have been asked by the "professional educators" to talk to the high school men about our profession?

As professional people we have pride, perhaps falsely, but most of us do not, I am sure, ask the opportunity to talk to the high school youth any more than do the medical people.

So long as the guidance and counseling program is the responsibility of the high school, is it not fair to ask who is responsible for the ignorance, the professional educator or the professional engineer?

Should we not then aim at reaching the professional educators and making them more aware of the engineers' privileges and responsibilities? Perhaps if they know more of what we are and what we do, we may some day answer the questions with which I started this letter and reach a knowledge and understanding of the term "cultural studies."

Why not look upstream for the source of the pollution?

H. L. MANNING, P.E.
Head, Dept. of Industrial Engineering,
Virginia Polytechnic Institute,
Blacksburg, Va.

► ***As a matter of interest to our readers, it could be mentioned here that NSPE is now doing considerable work along the line suggested by Engineer Manning. For example, the Society now has a list of counselors who have offered their services as advisors to any young engineer or student. Another activity was the publication and distribution by the NSPE of a specially prepared booklet for high school students, designed to acquaint this group with the profession. And we cannot, of course, overlook the excellent work of our chapters. Many have held meetings with students, distributed literature, given advice, and so forth.—Editor.***

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EDITORIALS

Can We "Find" 40,000 Engineers? . . .

Executive Director Paul H. Robbins' article on utilization of engineers in the Air Force points up a matter the AMERICAN ENGINEER has been talking about for a long time. Namely, that the best and most profitable place to start doing something about the engineering shortage is to properly use the engineers we have. We must get engineers out of sub-professional jobs and put them to work doing the kind of engineering duties for which they have been trained.

Recognizing that there is an acute shortage of engineers, what can we do about it? Turn out more graduates from our engineering schools? That would be highly desirable, except that the students just aren't available to be trained. It takes at least four years to make an engineer out of a high school graduate. We can (and we have been) encouraging the cream of the crop of high school graduates to embark upon engineering as a profession. But that program can't begin to help the engineering shortage until 1954 at the earliest.

Which brings us right back to our thesis that proper utilization of engineers by industry, government and private consultants is the best method of effecting a cure for the shortage. Take a simple mathematical formula to illustrate what we mean:

We have about 400,000 engineers in America. If we can increase the productiveness of each of them by 10%, we will have "found" 40,000 engineers. This number will go a long way toward curing our shortage. We believe that the goal of increasing each engineer's productiveness 10% is easily within reach. Getting engineers out of sub-professional work is the best way to start.

The Modest Ones . . .

A few moments of reflection can bring to mind many titles of books, motion pictures, radio programs and even comic strips dealing with such professional men as doctors, lawyers, architects and editors. Unfortunately, the engineering profession has not received this wide publicity.

Radio audiences follow with great interest the adventures of that hardy perennial "Dr. Kildare" as well as "Dr. Christian," and support the exciting activities of "Mr. District Attorney." The gentlemen of the Fourth Estate are well represented by "Big Story" and the crusading editor Steve Wilson who appears on "Big Town."

In the field of the novel and biography, American readers have become acquainted with such widely diverse members of the legal profession as Oliver Wendell Holmes in "Yankee from Olympus," and William Fallon in "The Great Mouthpiece." Irving Stone's "Clarence Darrow for the Defense" as well as Darrow's autobiography have introduced many readers to this estimable gentleman of the bar. A new biography of Charles Evans Hughes is due for release on the 30th of this month. Ayn Rand's "The Fountainhead," reportedly based on the life of Frank Lloyd Wright, helped to increase the public's store of information concerning the architect. In the field of medicine, talented writers have turned out such well-known works as "Arrowsmith," "The Microbe Hunters," and "Burma Surgeon." Books such as Conant's "Science and Common Sense" and the new release, "The Nature of Things" by Dr. Marshall, NBC-TV's science expert, have boosted the scientist's status in public eyes. The science-fiction mania which is currently sweeping the country has also made America increasingly science-conscious.

The motion picture industry has also contributed to a wider understanding of the medical and legal professions with such pictures as "Magnificent Obsession" and "The Citadel" as well as the Kildare series for the men in white. The bar received excellent publicity in "The People Against O'Hara," "The Magnificent Yankee" and even in the Andy Hardy series. In numerous movies doctors and lawyers that figure incidentally in the plot are presented as kindly humanitarians, whose interests are only for their patient's and client's welfare or seeing justice done.

The finger of blame may be pointed in many directions to explain just why the engineer has been sparingly written about, screened or aired. It may stem from the profession's modest unwillingness to "blow its own horn," or the public may not be well enough informed on the profession's activities. However, there is much material in engineering which should interest a creative artist. Particularly valuable from a story standpoint would be the biographies of many of our famous engineers in the past. Certainly Goethals' feat in building the Panama Canal and the story of the Roeblings and the Brooklyn Bridge should be given more extensive treatment. Valuable documentary films could be made of important engineering projects.

It's time for engineers to become as familiar to the American public as doctors, lawyers, scientists or editors. Certainly a first step toward increasing interest in the profession would be for engineers themselves to realize that they are working in an imaginative, important and even dramatic profession, and then to convey this feeling to others.